MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

VOL. XXVII. DECEMBER, 1899. No. 12

INTRODUCTION.

The MONTHLY WEATHER REVIEW for December, 1899, is based on reports from about 3,044 stations furnished by paid and voluntary observers, classified as follows: regular stations of the Weather Bureau, 158; West Indian service stations, 12; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,498; Army post hospital reports, 27; United States Life-Saving Service, 14; Southern Pacific Railway Company, 96; Canadian Meteorological Service, 32; Mexican Telegraphic Service, 20; Mexican voluntary stations, 7. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Senor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Señor A. M. Chaves, Director-General of Mexican Telegraphs; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; and Capt. J. E. Craig, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local meridian is mentioned.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

On December 1 an area of high barometer appeared on the north Pacific coast. This high area marked a change in the weather conditions which had attended a rapid succession of areas of low barometer from the North Pacific Ocean during the preceding three weeks and inaugurated a period of colder weather, which was experienced first in the Northwestern, then in the Central, and by the night of the 4th in the Atlantic and Southern States.

These changes were first announced in the general forecast of the evening of the 1st, and on the morning of the 2d a special forecast was made of several days of cold, wintry weather for the middle and northern Rocky Mountain regions.

The anticipated cold weather overspread the Western and Northwestern States during the day and night of the 3d. On the morning of the 4th a special bulletin on the cold weather was issued, which contained a forecast that during the night of the 4th the temperature would fall to about 20° in the Middle Atlantic States, that heavy frost would occur southward to the Gulf and south Atlantic coast lines, and that after the 5th the weather would moderate over the eastern half of the country. This forecast was verified in detail.

On the 14th stockmen in Idaho, and in Oregon and Washington east of the Cascades, were warned of a period of unusually low temperature. On the morning of the 15th special warnings of heavy snow and unusual cold were telegraphed to the States of the middle and northern Rocky Mountain and middle and northern Plateau regions.

During the night of the 15th heavy snow fell in Idaho, northern Utah, and elsewhere in the middle and northern Rocky Mountain districts; in Colorado a heavy snow and wind storm caused a blockade of railroads along the Arkansas-Platte Divide, and very low temperature continued several days in the Western and Northwestern States.

On the 14th special warnings of high northerly winds and freezing temperature were sent to points on the west coast of the Gulf of Mexico, and a general forecast was issued announcing several days of low temperature east of the Mississippi River.

Low temperature prevailed east of the Rocky Mountains from the 24th until the close of the month, a minimum of 30° occurring at Jacksonville, Fla., the morning of the 30th.

In the Gulf and extreme south Atlantic districts, where crops are subject to damage by frost during the winter months, the frosts of December were accurately forecast for periods of twenty-four to thirty-six hours in advance. Local interests were warned of the frost in northern Florida on the 30th by the official in charge of the Weather Bureau office at Jacksonville.

The severest storm of the month crossed the Great Lakes during the 11th and 12th. All lake ports and shipping in-

terests were given ample warning that this storm would be unusually severe. On the north Pacific coast the most important storm of the month occurred on the 14th and 15th. The principal storm of the month in the Atlantic States occurred on the middle Atlantic and south New England coasts on the 24th.

The display of wind signals was discontinued for the season on Lake Pepin, November 30; on Lake Michigan, December 10; on Lake Huron, December 12; on Lakes St. Clair, Erie, and Ontario, December 15; and on December 17, the date of the closing of the locks, at Sault Ste. Marie, Mich.

Referring to the movements of vessels on the Great Lakes during the close of the season of 1899, Mr. Harvey C. Beeson, publisher of Beeson's Marine Directory, remarks in the Milwaukee Sentinel of December 21, 1899, as follows:

A number of vessels have been making trips, with comparatively little danger, in the past few weeks, without insurance. They have relied a great deal upon the weather forecasts in determining their action; and I want to say here that the value of our Weather Bureau service has never been so signally shown as it has this season.

CHICAGO FORECAST DISTRICT.

Up to the time of closing of navigation warnings were issued for storms which occurred on the upper Lakes on the 1st, 5th, 11th to 13th, and 24th and 25th. The storm of the 11–13th was particularly severe, and special forecasts and warnings regarding its progress and character were issued as follows: Storm signals were ordered 9:45 a. m., 11th, for Lakes Huron and Superior. On Lake Michigan warnings were sent to open ports, the display of signals for the season having terminated. All upper Lake stations were advised to hold vessels in port, as a severe storm was central over Illinois and moving northeastward, which would cause dangerous easterly shifting to northerly gales, with rain turning to snow and much colder weather. At 9:15 p. m. of the 11th the following message was sent to all observers:

Storm central over northern Illinois, increasing in intensity. Dangerous gales indicated. Colder and snow. Continue to hold vessels in port.

At 9:45 a. m., December 12, the signals on Lake Superior were changed to storm northwest, and the following message was sent to all upper Lake stations:

Dangerous northwest gales, diminishing Wednesday. Snow and colder.

During the gale the steamer *Arthur Orr* went ashore on Lake Huron at Cove Island. She was badly damaged, but later released. The whaleback barge *No.* 115, which was in tow of the steamer *Colgate Hoyt*, broke away off the Portage Canal and foundered on the north shore of Lake Superior. Ample warning that the storm would be unusually severe was given, and all vessel masters had an opportunity to seek shelter.

Ample and detailed warnings were given of the cold weather which overspread the Western States on the 3d and 4th and 24th and 25th.—*H. J. Cox, Professor.*

SAN FRANCISCO FORECAST DISTRICT.

On the morning of the 6th conditions were such as to warrant a forecast of light to heavy frost in citrus fruit belt; temperatures below freezing were reported on the morning of 7th.

Southeast storm signals were displayed along the north coast on the 7th and justified. On the 9th citrus fruit growers were again warned that conditions were favorable for heavy frosts Sunday morning. Minimum temperatures of 29° and 30° were reported on the mornings of the 10th, 11th, and 12th. On the 13th it was stated that conditions were favorable for the heaviest frost of the season to date, and it may be noted that in the center of the orange belt the lowest minimum temperature, 28°, which occurred during the month of December was reported.

From December 19 to 29 an area of high pressure covered the country between the Sierras and the Rocky Mountains. Connected with this pressure distribution was the prevalence of tule fog in the great valleys of California. For about ten days in the San Joaquin Valley, in the Sacramento Valley, and also in the other valleys of California peculiar temperature inversions were reported. The cold air from the northeast was evidently slowly drained into the valleys and, owing to the absence of wind, gradually settled to the low lands. This ground or tule fog was so dense as to seriously inconvenience farming operations. Day after day the morning and evening temperatures would remain at about 36°, the amplitude of the diurnal curve, which is generally about 10°, ranging from 40° to 50°, ranging from about 36° to 38°. The persistence of this condition is noteworthy, and also the fact that the breaking up of this condition was accurately forecast on the morning of the 29th. On the 29th the approach of an extensive storm of considerable energy was forecast, and southeast storm signals were displayed from San Francisco to Eureka.—*A. G. McAdie, Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

The river forecasts issued during the month were of much interest and value.

On the 14th the outlook was such that a special warning to stockmen was included in the forecasts for Idaho, and Oregon and Washington east of the Cascades. It was stated that severe weather of four to six days' duration was indicated for the country east of the Cascades. Although the fall in temperature was not as great as was anticipated, yet there ensued six days of cold weather—the coldest yet this season—during which a temperature of 10° occurred at Spokane, 8° at Walla Walla, 6° at Baker City, and zero at Kalispell.—*G. N. Salisbury, Section Director.*

No special warnings were issued for the Havana forecast district.

AREAS OF HIGH AND LOW PRESSURE.

During the month there were nine highs and fifteen lows which were sufficiently well defined to admit of being charted. See Charts I and II.

The following table gives the principal facts regarding the place of origin and disappearance of these highs and lows, together with other pertinent data. Some descriptive data is also added.

Highs.—The three highs which were first noted on the the Pacific coast. Nos. I, III, and V, disappeared in the central Rocky Mountain region. Of the three which first came within the field of observation in the British Northwest Territory, two, Nos. II and IX, moved southeastward to the south Atlantic coast, while the other, No. VI, moved eastward, disappearing toward Hudson Bay. No. VIII originated in southeastern Colorado, moved eastward to northern Maryland, and thence northeastward to Nova Scotia. Nos. IV and VII were of minor importance.

A high of considerable magnitude remained practically stationary in the British Northwest Territory from the morning of the 14th to the evening of the 16th, reaching its crest on the morning of the 15th. On the 18th the characteristic winter type of high peculiar to the northern and middle Plateau, appeared over those districts, and still persisted at the close of the month, but with much diminished intensity and many indications of early dissipation.

Lows.—Four of the fifteen lows, Nos. III, V, VIII, and X,

were first noted on the extreme north Pacific coast. No. III disappeared over the Saskatchewan Valley by the time the one hundred and fifth meridian was reached; No. V disappeared a short distance east of Manitoba within two days; No. VIII moved southeastward to a vanishing point in northern Kansas, while No. X remained stationary for two days, and then moved entirely across the country, disappearing into the ocean off Newfoundland, after causing considerable heavy snow over the northern tier of States east of the Mississppi River. No. VII, which first appeared on the Mexican Gulf coast, developed into the severest storm of the month, and moved almost due northward up the Mississippi Valley, then slightly northeastward beyond Lake Superior. Some of the high wind velocities attained as a result of this low are as follows: Chicago, 56 miles an hour; Buffalo, 64; Cleveland, 52; New York, N. Y, 56, and Boston, 40. Nos. XIII and XV originated over Lake Superior, and disappeared over the St. Lawrence Valley. No. XIV, although of limited duration and extent, resulted in severe freezing temperatures in northern and central Florida on the night of January 1, 1900. No. IX, during the passage of which the lowest pressures of the month were recorded, first appeared in southern Texas, moved almost due northeastward through the St. Lawrence Valley, and thence eastward by way of Newfoundland. During this storm New York, N. Y., reported a wind velocity of 60 miles an hour; Cleveland, 52; Buffalo, 46, and Block Island, 48. Low No. XII moved rapidly from northern Alberta to western Gulf of Mexico. No. XI consisted in reality of two separate storms, one first appearing in northern Alberta, and the other in Misisssippi. The two joined forces in western Ontario in two and one-half days, and moved eastward as one storm to about the seventieth meridian, where it disappeared. The remaining lows were not of great importance.—*H. C. Frankenfield, Forecast Official.*

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, p. m.	46	124	3, p. m.	42	109	1,450	2.0	725	30.2
II	3, a. m.	53	108	7, p. m.	33	79	3,955	4.5	719	30.0
III	5, a. m.	41	124	7, a. m.	39	109	1,140	2.0	570	23.8
IV	8, p. m.	48	85	10. a. m.	44	68	970	1.5	647	27.0
V	9, a. m.	41	124	10, p. m.	41	105	1,150	1.5	767	31.9
VI	12, a. m.	53	108	14, a. m.	48	85	1,250	2.0	625	26.0
VII	12, a. m.	30	90	13, p. m.	33	80	750	1.5	500	20.8
VIII	14, p. m.	38	105	17, p. m.	46	60	2,730	3.0	910	38.0
IX	25, p. m.	48	100	27, a. m.	34	78	1,680	1.5	1,120	46.7
Sums							15,075	19.5	6,583	274.4
Mean of 9 paths							1,675		731	30.5
Mean of 19.5 days									773	32.2
Low areas.										
I	2, a. m.	41	96	5, a. m.	50	64	2,250	3.0	750	31.2
II	4, p. m.	50	100	6, a. m.	45	77	1,125	1.5	750	31.2
III	4, a. m.	48	125	5, p. m.	53	105	1,225	1.5	817	34.0
IV	6, p. m.	54	114	10, a. m.	46	60	2,750	3.5	786	32.7
V	7, a. m.	46	124	9, a. m.	50	97	1,485	2.0	742	30.9
VI	9, a. m.	38	100	10, a. m.	49	89	1,020	1.0	1,020	42.5
VII	10, a. m.	26	98	12, a. m.	46	87	1,610	2.0	805	33.5
VIII	10, p. m.	48	125	12, a. m.	40	98	1,600	1.5	1,067	44.4
IX	13, p. m.	30	99	16, a. m.	48	54	2,800	2.5	1,120	46.7
X	16, p. m.	46	124	20, a. m.	48	54	3,600	3.5	1,029	42.9
XI *	22, p. m.	32 54	91 114	25, a. m.	47	71	1,920 2,150	2.5	768 860	32.0 35.8
XII	24, p. m.	54	114	27, a. m.	26	98	2,290	2.5	916	38.2
XIII	27, p. m.	46	84	30, a. m.	49	64	1,725	2.5	690	28.8
XIV	30, p. m.	30	95	31, p. m.	28	83	980	1.0	980	40.8
XV	31, p. m.	46	84	†2, a. m.	48	64	1,380	1.5	920	38.3
Sums							29,910	34.5	14,020	583.9
Mean of 16 paths							1,869		876	36.5
Mean of 34.5 days									867	36.1

* No. XI considered as two in totals and means. †January.

RIVERS AND FLOODS.

On account of the formation of ice, there was less water than during the preceding month in the Mississippi River north of Cairo, and in the Missouri, except at Kansas City, the lowest stages occurring either near the end of the month or at the time the ice closed the rivers.

Floating ice was observed as early as the 4th of the month at La Crosse, on the 5th at St. Paul, the 6th at Davenport, 15th at Keokuk and Hannibal, and 18th at St. Louis and Chester. At St. Paul, on the 19th, the ice gorged above the Robert street bridge in front of the city; on the 27th the river closed at Davenport, and on the 30th at Keokuk. At Hannibal the ice gorged at the Wabash Bridge on the 26th, and on the 30th above Chester, but only for a few hours.

In the Missouri River the first ice reached Omaha on the 4th, Kansas City on the 13th, Boonville, Mo., on the 25th, and Herrmann, Mo., on the 15th. The river was closed at Bismarck on the 10th, at Pierre on the 17th, and at Sioux City on the 20th.

Navigation was suspended by the 15th on the Mississippi River as far south as Hannibal, by the 20th on the Missouri River as far as Sioux City, and on the lower Missouri River on the 26th.

The Ohio and lower Mississippi rivers were higher than during November, 1899, and owing to the abundance of water there was a general resumption of navigation on the former about the 14th. There was some ice during the latter part of the month, reaching Paducah, Ky., on the 31st. It caused some interruption to navigation at various places, and on the 30th resulted in its entire suspension between Pittsburg and Cincinnati.

In the lower Mississippi River and its tributaries the water averaged from one to eight feet higher than during November, except from New Orleans southward, but no high stages were recorded.

The rivers of the Middle Atlantic States changed but little during the month. The Susquehanna River was filled with ice at Wilkesbarre, Pa., after the 25th, and froze over on the 30th. Ice also appeared at Williamsport, Pa., on the West Branch of the Susquehanna River on the 25th.

There was considerable ice in the Potomac River during the last week of the month, interfering somewhat with navigation on the lower river, although a channel was kept open by the larger steamers.

The James River froze over at Lynchburg on the 30th and at Richmond on the 29th. The most southerly point from which ice was reported was Weldon, N. C., on the Roanoke River.

Over the Mobile system and in the rivers of the South Atlantic States the stages were considerably higher than during the preceding month, particularly over the former, where heavy rains during the middle of the month caused a marked rise. At Demopolis, Ala., on the Tombigbee River, there was a rise of 30 feet from the 10th to the 17th, 22 feet of which occurred from the 12th to the 15th. At Tuscaloosa, Ala., on the Black Warrior River, there was a rise of about 39 feet from the 10th to the 13th. Danger line stages were not quite reached, and no loss or damage resulted as far as is known.

On the Pacific coast the only item of interest was the rise in the Willamette River during the early days of the month, the danger line stage of 15 feet being reached at Portland, Oreg., on the 2d. This rise began during the closing days of November, and all interests were kept fully advised as to the probable maximum stage. There was a second rise from the 10th to the 14th, and on the 13th, at Albany, Oreg., a stage of 21.2 feet was recorded, 1.2 feet above the danger line.

A study of the gradual movement of the line of total freezing, and the varying thickness of the ice in the rivers, affords

an excellent method of observing the intensity and duration of the winter season. The following table, compiled mostly from data taken from the weekly snow and ice charts, shows these conditions as they existed at the end of each week, commencing December 4, 1899:

Thickness of ice in rivers (in inches), winter of 1899–1900.

Stations.	December.				January.				
	4	11	18	25	1	8	15	22	29
Moorhead, Minn					12.0				
Williston, N. Dak	1.0	1.5	6.0	8.0	16.0				
Bismarck, N. Dak			1.5	9.0	16.0				
Pierre, S. Dak			1.5	3.5	14.0				
Yankton, S. Dak			5.0	7.0	10.0				
Sioux City, Iowa				1.5	10.0				
Omaha, Nebr					10.0				
St. Paul, Minn					12.5				
La Crosse, Wis				5.0	10.0				
Dubuque, Iowa			4.0	5.0	12.0				
Davenport, Iowa					8.0				
Keokuk, Iowa					10.0				
Hannibal, Mo					8.0				
Topeka, Kans					6.5				
Wichita, Kans					2.0				
Pittsburg, Pa					4.0				
Parkersburg, W. Va					1.0				
Louisville, Ky					5.0				
Columbus, Ohio					7.0				
Bangor, Me			2.0	2.0	4.5				
Albany, N. Y					4.0				
Philadelphia, Pa					2.0				
Washington, D. C					5.0				
Lynchburg, Va					4.0				

A comparison of this table with the one which appeared in the REVIEW for January, 1899, shows clearly and graphically the mildness of the present month as contrasted with December, 1898. No ice was reported in the rivers during November of this year, while in 1898 it appeared in the upper Missouri River in the early days of the month, and in the Mississippi River on the 22d. It steadily increased in thickness during December, and at the end of the month was about twice as thick as on December 31, 1899, although the southern limits of total freezing were nearly identical over the Mississippi system. It should also be remarked that during the present year there was no ice of consequence until the last week of the month.

The highest and lowest water, mean stage, and monthly range at 123 river stations are given in the accompanying table. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Forecast Official.*

Heights of rivers referred to zeros of gages, December, 1899.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
St. Paul, Minn.[1]	1,954	14	4.7	1,2	2.5	7,8		2.2
Reads Landing, Minn.[2]	1,884	12	2.7	1	0.7	24,25,29-31	1.4	2.0
La Crosse, Wis.[3]	1,819	12	6.0	19	3.2	9-16	3.7	2.8
North McGregor, Iowa.[4]	1,759	18	3.9	1-5	2.8	14		1.5
Dubuque, Iowa.[5]	1,699	15	3.8	1	2.8	15	3.3	1.0
Leclaire, Iowa.[6]	1,609	10	2.2	1,2	— 0.4	18	1.5	2.6
Davenport, Iowa[7]	1,593	15	3.7	27	0.6	19,22	2.3	3.1
Muscatine, Iowa	1,562	16	4.1	2,5	1.1	24,25	3.0	3.0
Galland, Iowa.[8,14]	1,472	8	1.6	1	0.4	27,28	1.1	1.2
Keokuk, Iowa[9]	1,463	15	2.6	30	— 1.7	28	0.7	4.3
Hannibal, Mo.[9]	1,402	13	3.3	1-5	— 1.5	30	2.1	4.8
Grafton, Ill	1,306	23	4.8	1	0.8	31	3.6	4.0
St. Louis, Mo	1,264	30	5.4	1	— 0.6	31	3.8	6.0
Chester, Ill	1,189	36	3.4	1,2	— 0.5	31	2.4	3.9
Memphis, Tenn	843	33	11.0	30	2.5	10-13	5.5	8.5
Helena, Ark	767	42	16.1	30,31	4.7	11,12	8.0	11.4
Arkansas City, Ark	635	42	17.3	31	4.9	16	8.3	12.4
Greenville, Miss	595	42	13.5	31	3.8	16-18	6.3	9.7
Vicksburg, Miss	474	45	12.7	31	2.0	17-19	4.4	10.7
New Orleans, La	108	16	4.3	11,12	2.9	2-5,7,8,25	3.3	1.4

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Missouri River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Bismarck, N. Dak.[9]	1,309	14	3.5	10	0.5	5	2.1	3.0
Pierre, S. Dak.[10]	1,114	14	2.4	1-3	0.7	14,17	1.4	1.7
Sioux City, Iowa.[11]	784	19						
Omaha, Nebr	669	18	6.8	1-5	4.3	24	5.6	2.5
Plattsmouth, Nebr	641							
St. Joseph, Mo	481	10	2.0	14	— 1.1	29-31	0.5	3.1
Kansas City, Mo	388	21	12.1	18	5.2	31	7.3	6.9
Boonville, Mo	199	20	5.5	1,2	3.1	24	4.6	2.4
Hermann, Mo	103	24	4.9	1-6	2.3	31	4.2	2.6
Illinois River.								
Peoria, Ill	135	14	6.6	26	4.5	5,7-9	5.3	2.1
Youghiogheny River.								
Confluence, Pa.[12]	59	10	4.1	13	0.9	11	2.0	3.2
West Newton, Pa.[13]	15	23	7.0	13	0.8	8	2.0	6.2
Allegheny River.								
Warren, Pa	177	14	7.2	13	0.6	1,2	2.9	6.6
Oil City, Pa	123	13	8.2	20	1.2	1,2	3.8	7.0
Parker, Pa.[13]	73	20	9.5	20	1.1	1,2	4.2	8.4
Monongahela River.								
Weston, W. Va.[5]	161	18	2.8	20	— 0.7	9,10	0.1	3.5
Fairmont, W. Va.[13]	119	25	6.0	25	0.8	9-11	2.4	5.2
Greensboro, Pa.[2]	81	18	12.2	13	7.0	2,7-11	8.3	5.2
Lock No. 4, Pa	40	28	14.0	13	8.2	31	10.0	5.8
Conemaugh River.								
Johnstown, Pa	64	7	4.6	13	1.9	6,7,10	2.7	2.7
Red Bank Creek.								
Brookville, Pa	35	8	2.6	13	1.0	1,5-11	1.4	1.6
Beaver River.								
Ellwood Junction, Pa.	10	14	5.0	20,21	— 0.5	4-6	2.0	5.5
Great Kanawha River.								
Charleston, W. Va.[12]	61	30	7.9	14	3.2	30,31	6.1	4.7
New River.								
Hinton, W. Va	93	14	4.3	14	1.0	8-10	1.5	3.3
Cheat River.								
Rowlesburg, W. Va.[2]	36	14	5.0	13	1.5	1	2.9	3.5
Ohio River.								
Pittsburg, Pa	966	22	13.8	14	2.5	31	7.4	11.3
Davis Island Dam, Pa	960	25	13.4	14	3.9	2	7.4	9.5
Wheeling, W. Va	875	36	17.7	15	4.0	3,4	9.4	13.7
Parkersburg, W. Va	785	36	17.2	23	5.1	5	10.2	12.1
Point Pleasant, W. Va	703	39	18.5	16	3.4	6,7	9.5	15.1
Huntington, W. Va	660	50	21.3	17	6.0	7,8	12.6	15.3
Catlettsburg, Ky	651	50	21.3	17	3.9	7,8	11.4	17.4
Portsmouth, Ohio	612	50	21.0	17	5.1	8	12.1	15.9
Cincinnati, Ohio	499	50	23.0	26	6.3	9,10	13.4	16.7
Madison, Ind	413	46	20.0	27	6.0	11	11.8	14.0
Louisville, Ky	367	28	9.4	27	3.6	10,11	6.4	5.8
Evansville, Ind	148	35	17.0	29	4.6	11	9.5	12.4
Paducah, Ky	47	40	15.6	29	2.7	6-11	7.9	12.9
Cairo, Ill	1,073	45	18.4	27	6.5	8-11	11.3	11.9
Muskingum River.								
Zanesville, Ohio	70	20	11.7	21	6.0	5	7.6	5.7
Miami River.								
Dayton, Ohio	69	18	2.1	21	0.7	7-9	1.3	1.4
Wabash River.								
Mount Carmel, Ill.[2]	50	15	7.4	24	1.4	10,11	3.5	6.0
Licking River.								
Falmouth, Ky.[7]	30	25	5.0	24,25	1.0	4,10,11	2.0	4.0
Clinch River.								
Speers Ferry, Va	156	20	2.2	25	— 0.7	10	0.4	2.9
Clinton, Tenn.[8]	46	25	7.0	27	1.9	1	3.4	5.1
Tennessee River.								
Knoxville, Tenn	614	28	4.7	14	— 0.8	11	1.1	5.5
Kingston, Tenn	534	25	5.2	26	0.7	1	2.3	4.5
Chattanooga, Tenn	430	33	7.6	14	1.4	9-11	4.0	6.2
Bridgeport, Ala	390	24	6.0	15	0.4	7-11	2.8	5.6
Florence, Ala	220	16	6.7	26	0.3	5,9,10	3.7	6.4
Riverton, Ala	190	25	8.9	26,27	— 0.8	5,7-10	4.4	9.7
Johnsonville, Tenn	94	21	10.3	27	0.9	8-10	5.7	9.4
Cumberland River.								
Burnside, Ky	434	50	7.8	25	0.1	10,11	2.6	7.7
Carthage, Tenn	175	40	9.7	25	0.6	5,7-10	4.3	9.1
Nashville, Tenn	257	40	13.7	24,25	0.8	1-5	6.6	12.9
Arkansas River.								
Wichita, Kans	726	10	2.4	10	1.9	22	2.1	0.5
Webbers Falls, Ind. T	413	23	2.6	1	2.0	{13, 16, 18} {20,21}	2.2	0.6
Fort Smith, Ark	351	22	8.3	20	2.3	15,16	4.5	6.0
Dardanelle, Ark	256	21	7.8	22	2.4	16-18	4.1	5.4
Little Rock, Ark	176	23	9.0	23	3.7	12,17,18	5.5	5.3
White River.								
Newport, Ark	150	26	6.7	21	2.0	10	3.9	4.7
Yazoo River.								
Yazoo City, Miss	80	25	6.3	24,25	— 1.7	1	2.5	8.0
Red River.								
Arthur City, Tex.[15]	80	25						
Fulton, Ark	688	27	21.5	1	9.5	12,13	13.5	12.0
Shreveport, La	565	28	13.5	1	7.9	15,16	10.4	5.6
Alexandria, La	449	29	11.4	4-6	5.6	18,19	8.5	5.8
Ouachita River.								
Camden, Ark	340	39	10.7	23	4.1	9,10	6.6	6.6
Monroe, La	100	40	5.9	28-31	1.3	4,5	2.0	4.6
Atchafalaya River.								
Melville, La	100*	31	14.3	31	8.3	1	10.6	6.0
Susquehanna River.								
Wilkesbarre, Pa.[13]	178	14	5.4	27	0.0	1-12	2.1	5.4
Harrisburg, Pa	70	17	6.8	26	1.5	3-12	3.4	5.3
W. Br. of Susquehanna.								
Williamsport, Pa	35	20	7.5	14	1.5	1,2,7	3.6	6.0
Juniata River.								
Huntingdon, Pa	80	24	4.8	13	3.0	1-12	3.6	1.8
Potomac River.								
Harpers Ferry, W. Va	170	16	2.8	25	0.7	13	1.5	2.1

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
James River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Lynchburg, Va.[12]	257	18	1.6	13	0.0	1-3,8-11	0.4	1.6
Richmond, Va.[2]	110	12	0.9	24	— 2.8	28	—1.3	3.7
Roanoke River.								
Weldon, N. C.	90	40	11.9	14	6.9	31	8.5	5.0
Cape Fear River.								
Fayetteville, N. C.	100	38	14.0	14	4.0	13,22	6.4	10.0
Lumber River.								
Fairbluff, N. C.	10	6	4.1	10-12	2.9	1	3.5	1.2
Edisto River.								
Edisto, S. C.	75	17	5.3	1	4.1	23-28	4.5	1.2
Pedee River.								
Cheraw, S. C.	145	27	9.0	14	1.2	11	3.0	7.8
Black River.								
Kingstree, S. C	60	12	5.3	22,23	3.7	29	4.6	1.6
Lynch Creek.								
Effingham, S. C.	35	12	8.3	6	4.8	26	6.1	3.5
Santee River.								
St. Stephens, S. C.	50	12	7.3	19,20,31	1.8	13	5.4	5.5
Congaree River.								
Columbia, S. C.	37	15	4.2	25	0.0	10	0.9	4.2
Wateree River.								
Camden, S. C.	45	24	17.4	14	3.3	11	6.2	14.1
Waccamaw River.								
Conway, S. C.	40	7	2.6	24	1.3	1	2.1	1 3
Savannah River.								
Calhoun Falls, S. C.	347	.....	5.0	13	2.4	10	3.2	2.6
Augusta, Ga.	268	32	14.5	14	6.0	9,10	8.1	8.5
Broad River.								
Carlton, Ga.	30	.....	4.4	24	2.2	7-11,23	2.6	2.2
Flint River.								
Albany, Ga	80	20	5.1	31	3.1	21	4.0	2.0

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Chattahoochee River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
West Point, Ga	239	20	6.0	24	2.4	11	3.6	3.6
Coosa River.								
Rome, Ga	225	30	7.5	25	0.8	8-11	2.5	6.7
Gadsden, Ala	144	18	10.8	13	— 0.2	9,10	3.4	11.0
Alabama River.								
Montgomery, Ala.	265	35	15.6	13	1.0	10	6.7	14.6
Selma, Ala	212	35	17.8	15	1.3	9,10	7.1	16.5
Tombigbee River.								
Columbus, Miss.	285	33	13.4	12	— 2.9	9	4.7	16.3
Demopolis, Ala.	155	35	29.2	17	— 0.8	10	14.4	30.0
Black Warrior River.								
Tuscaloosa, Ala	90	43	39.5	13	0.6	9,10	12.8	38.9
Columbia River.								
Umatilla, Oreg	270	25	7.5	4	5.1	22	6.0	2.4
The Dalles, Oreg	166	40	11.9	3	7.2	23	9.1	4.7
Willamette River.								
Albany, Oreg	99	20	21.2	13	5.5	29,30	9.9	15.7
Portland, Oreg	10	15	15.0	2	5.8	28	9.5	9.2
Sacramento River.								
Red Bluff, Cal.	241	23	12.3	15	3.2	13	5.3	9.1
Sacramento, Cal.	70	29	22.2	21-23	18 0	11	20.5	4.2

* Distance to Gulf of Mexico.

[1] Frozen after the 12th. [2] Frozen after the 28th. [3] Frozen after the 19th.
[4] Frozen after the 14th. [5] Frozen after the 15th. [6] Frozen after the 20th.
[7] Frozen after the 27th. [8] Frozen after the 30th. [9] Frozen after the 9th.
[10] Frozen after the 17th. [11] Frozen after the 4th. [12] Frozen on the 31st.
[13] Frozen after the 29th. [14] For 24 days only. [15] Gage carried away on the 4th.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

Alabama.—The mean temperature was 45.0°, or 2.2° below normal; the highest was 79°, at Uniontown on the 13th, and the lowest, 12°, at Oneonto on the 5th. The average precipitation was 5.80, or 2.00 above normal; the greatest monthly amount, 8.49, occurred at Florence, and the least, 3.41, at Highland Home.

Some slight damage to wheat and oats by freeze of 3d to 7th.—*F. P. Chaffee.*

Arizona.—The mean temperature was 46.7°, or 1.4° below normal; the highest was 95°, at Arivaca on the 2d, and the lowest, 1° below zero, at Flagstaff on the 21st. The average precipitation was 0.16, or 0.84 below normal; the greatest monthly amount, 1.60, occurred at Fort Apache, while none fell at a number of stations.—*W. G. Burns.*

Arkansas.—The mean temperature was 41.0°, or 2.4° below normal; the highest was 74°, at Camden on the 1st, at Prescott on the 2d, and at Luna Landing on the 7th, and the lowest, 8°, at Winslow on the 15th. The average precipitation was 4.08, or 0.11 below normal; the greatest monthly amount, 6.46, occurred at Mossville, and the least, 1.20, at Prescott.

The greater portion of wheat was sown late, but the weather has been favorable during the month, and the crop is in excellent condition.—*E. B. Richards.*

California.—The mean temperature for the State, obtained by weighting the reports from 269 stations, so that equal areas have about the same weight, was 45.8°, which was 0.4° below the December normal for the State, as determined from 188 records; the highest was 96°, at Irvine, Orange County, on the 24th; the lowest, 17° below zero, at Bodie, Mono County, on the 19th. The average precipitation for the State, as determined by the records of 288 stations, was 3.03; the deficiency, as indicated by reports from 200 stations, which have normals, was 0.87; the greatest monthly amount, 16.23, occurred at La Porte, Plumas County, and the least, trace, at several stations in southern California.—*Alexander G. McAdie.*

Colorado.—The mean temperature was 24.9°, or 1.0° below normal; the highest was 68°, at Trinidad on the 1st, 25th, and 26th, and the lowest, 42° below zero, at Troutvale on the 14th. The average precipitation was 0.90, or nearly normal; the greatest monthly amount, 2.80, occurred at Ruby, and the least, 0.06, at Saguache.—*F. H. Brandenburg.*

Florida.—The mean temperature was 59.2°, or nearly normal; the highest was 84°, at Nocatee on the 12th, 15th, and 16th, and the lowest, 23°, at McClenny on the 30th. The average precipitation was 2.07, or slightly below normal; the greatest monthly amount, 6.05, occurred at Pensacola, and the least, 0.58, at Myers and Orange City.—*A. J. Mitchell.*

Georgia.—The mean temperature was 45.0°, or 3.8° below normal; the highest was 80°, at Jesup and Mauzy on the 19th, and the lowest, 8°, at Dahlonega on the 30th. The average precipitation was 3.44, or 0.34 below normal; the greatest monthly amount, 6.56, occurred at Greenbush, and the least, 0.85, at Hephzibah.—*J. B. Marbury.*

Idaho.—The mean temperature was 25.8°, or 1.4° above normal; the highest was 61°, at Garnet on the 8th, and the lowest, 32° below zero, at Chesterfield on the 21st. The average precipitation was 1.65, or 0.30 below normal; the greatest monthly amount, 5.34, occurred at Murray, and the least, 0.37, at Garnet.—*S. M. Blandford.*

Illinois.—The mean temperature was 29.2°, or 1.7° below normal; the highest was 66°, at Centralia on the 1st, and the lowest, 8° below zero, at Scales Mound on the 30th. The average precipitation was 2.33, or about normal; the greatest monthly amount, 5.27, occurred at Raum, and the least, 1.17, at La Harpe.

Wheat is short in acreage in all northern and most central counties, but large acreage is reported in the southern district; little snow protection has been given the plant thus far, but it is generally strong and vigorous; the hessian fly seems to be about the only damaging cause.—*C. E. Linney.*

Indiana.—The mean temperature was 30.6°, or 2.2° below normal; the highest was 65°, at Vevay on the 1st and at Edwardsville on the 11th, and the lowest, 11° below zero, at Richmond on the 16th. The average precipitation was 3.16, or 0.38 above normal; the greatest monthly amount, 5.90, occurred at Vevay, and the least, 1.51, at Hammond.

During the cold nights in the middle of the month the ground was well covered with snow, but during the last week of the month, when very cold weather prevailed, the fields were bare, and it is feared the freezing and thawing injured the wheat, except in the eastern and southern portions, where it was protected by snow. In some fields, especially in the southern portion, the wheat never looked better; it is well rooted, green, and healthy. In other fields it looks brown and is apparently in bad condition. The hessian fly is injuring the early sown in many fields.—*C. F. R. Wappenhans.*

Iowa.—The mean temperature for December was 22.6°, or about 1.0° below normal; the highest was 75°, at Belknap on the 22d, and the lowest, 19° below zero, at Ruthven on the 31st. The mean temperature for the year was 47.6, or 0.2 above normal for the past decade. The average precipitation for December was 1.61, or slightly above normal; the greatest monthly amount, 4.28, occurred at Monticello, and the least, 0.10, at Clearlake. The average precipitation for the year was 29.10, or about 1.0 below normal for the past decade. The greatest

yearly amount, 42.06, occurred at Fort Madison, and the least, 21.79, at Plover.—*J. R. Sage, Director; G. M. Chappel, Assistant.*

Kansas.—The mean temperature was 31.4°, or 2.7 below normal; the highest was 73°, at Emporia and Norwich on the 9th, and the lowest, 12° below zero, at Coolidge on the 15th. The average precipitation was 1.22, or 0.08 above normal; the greatest monthly amount, 3.95, occurred at Chanute, and the least, 0.15, at Winona.

Wheat is in good condition, much of it fine, especially in central and southern counties. The early sown in northwestern counties not killed by drought is improving, and late sown is doing well.—*T. B. Jennings.*

Kentucky.—The mean temperature was 34.8°, or 3.4° below normal; the highest was 70°, at Jackson on the 11th and 12th, and at Catlettsburg and Warfield on the 12th, and the lowest, 15° below zero, at Eubank on the 31st. The average precipitation was 4.26, or 0.92 above normal; the greatest monthly amount, 6.22, occurred at Mount Hermon, and the least, 2.43, at Canton.

Favorable weather conditions prevailed during the month. Wheat is in excellent condition in nearly all parts of the State, and never looked more promising at this time of year. Some fields have been attacked by the hessian fly, but the damage is generally slight and appears only in few localities.—*H. B. Hersey.*

Louisiana.—The mean temperature was 51.1°, or 1.0° below normal; the highest was 87°, at Southern University Farm on the 26th, and the lowest, 20°, at Oakridge on the 6th, and at Mansfield and Plain Dealing on the 16th. The average precipitation was 5.57, or 1.51 above normal; the greatest monthly amount, 10.87, occurred at Rayne, and the least, 2.79, at New Orleans.—*W. T. Blythe.*

Maryland and Delaware.—The mean temperature was 36.0°, or 0.6° below normal; the highest was 69°, at Cumberland, Md., on the 8th, and the lowest, 6° below zero, at Sunnyside, Md., on the 31st. The average precipitation was 1.80, or 1.02 below normal; the greatest monthly amount, 4.63, occurred at Sunnyside, Md., and the least, 0.80, at Pocomoke, Md.—*F. J. Walz.*

Michigan.—The mean temperature was 26.1°, or normal; the highest was 64°, at Allegan on the 11th and at Reed City on the 12th, and the lowest, 26° below zero, at Iron River on the 30th. The average precipitation was 2.40, or 0.27 above normal; the greatest monthly amount, 5.39, occurred at Vandalia, and the least, 0.14, at Menominee.—*C. F. Schneider.*

Minnesota.—The mean temperature was 17.9°, or 1.7° above normal; the highest was 63°, at Lake Jennie on the 9th, and the lowest, 25° below zero, at Pokegama on the 30th. The average precipitation was 0.95, or 0.17 above normal; the greatest monthly amount, 4.05, occurred at Caledonia, and the least, 0.10, at Beardsley.

In the lumber region an almost entire absence of snow has interfered with lumbering operations.—*T. S. Outram.*

Mississippi.—The mean temperature was 45.9°, or 2.3° below normal; the highest was 79°, at Americus on the 19th, and the lowest, 13°, at Ripley on the 5th. The average precipitation was 6.33, or 2.15 above normal; the greatest monthly amount, 11.42, occurred at Port Gibson, and the least, 3.34, at Pearlington.—*H. E. Wilkinson.*

Missouri.—The mean temperature was 30.3°, or 3.6° below normal; the highest was 72°, at Wylie on the 2d, and the lowest, 13° below zero, at Edwards on the 15th. The average precipitation was 2.11, or 0.23 below normal; the greatest monthly amount, 6.10, occurred at New Madrid, and the least, 0.69, at Willowsprings.

In the central and northern portions of the State the weather during December was, on the whole, very favorable for wheat, the ground being covered with snow during the coldest weather, and at the close of the month the crop was generally reported in excellent condition, but in portions of the southern sections it is feared that condiderable damage resulted from the severe freezing weather of the last decade of the month, the covering of snow in those sections being too light to afford much protection.—*A. E. Hackett.*

Montana.—The mean temperature was 23.4°, or normal; the highest was 80°, at Crow Agency on the 24th, and the lowest, 30° below zero, at Glasgow on the 18th. The average precipitation was 0.95, or 0.11 below normal; the greatest monthly amount, 2.57, occurred at Troy, and the least, 0.01, at Dell.—*E. J. Glass.*

Nebraska.—The mean temperature was 25.5°, or 0.3° below normal; the highest was 66°, at Lexington on the 1st, and the lowest, 20° below zero, at Valentine on the 14th. The average precipitation was 0.84, or 0.15 above normal; the greatest monthly amount, 2.25, occurred at Clatonia, and the least, 0.08, at Imperial.—*G. A. Loveland.*

Nevada.—The mean temperature was 28.0°, or about 2.3° below normal; the highest was 68°, at Verdi on the 1st, and the lowest, 25° below zero, at Fenelon on the 19th. The average precipitation was 0.15, or about 0.22 below normal; the greatest monthly amount, 5.46, occurred at Lewers Ranch, and the least, 0.07, at Mill City.—*J. H. Smith.*

New England.—The mean temperature was 30.4°, or 2.7° above normal; the highest was 68°, at Enosburg Falls, Vt., on the 12th, and at Provincetown, Mass., on the 24th, and the lowest, 16° below zero, at Enosburg Falls, Vt., on the 30th. The average precipitation was 2.10, or 1.41 below normal; the greatest monthly amount, 3.42, occurred at Eastport, Me., and the least, 0.93, at Provincetown, Mass.—*J. W. Smith.*

New Jersey.—The mean temperature was 35.5°, or 1.3° above normal; the highest was 69°, at Beverly on the 11th, and the lowest, 1° below zero, at Belvidere on the 31st. The average precipitation was 2.11, or 1.00 below normal; the greatest monthly amount, 4.30, occurred at Charlotteburg, and the least, 1.29, at Vineland.—*E. W. McGann.*

New Mexico.—The mean temperature was 36.3°, or 1.2° above normal; the highest was 77°, at Roswell on the 2d, and the lowest, 7° below zero, at Winsors on the 14th. The average precipitation was 0.46, or 0.42 below normal; the greatest monthly amount, 1.80, occurred at Bell Ranch, while Espanola and Strauss recorded none, and Deming, Fort Bayard, Fort Union, and Lordsburg only a trace.—*R. M. Hardinge.*

New York.—The mean temperature was 29.1°, or 1.4° above normal; the highest was 66°, at Poughkeepsie on the 12th, and the lowest, 25° below zero, at North Lake on the 31st. The average precipitation was 3.40, or 0.31 above normal; the greatest monthly amount, 7.72, occurred at Watertown, and the least, 0.89, at Poughkeepsie.

The weather was mild and favorable for wheat and rye, which are reported in excellent condition at the close of the month.—*R. G. Allen.*

North Carolina.—The mean temperature was 40.3°, or 2.1° below normal; the highest was 75°, at Southport on the 19th, and the lowest, 5° below zero, at Linville on the 31st. The average precipitation was 2.94, or 0.80 below normal; the greatest monthly amount, 10.55, occurred at Highlands, and the least, 0.92, at Mount Airy.

Wheat was generally reported in excellent condition to stand the winter.—*C. F. von Herrmann.*

North Dakota.—The mean temperature was 12.8°, or 0.3° below normal; the highest was 60°, at Power on the 23d, and the lowest, 26° below zero, at Gallatin on the 4th. The average precipitation was 0.30, or 0.21 below normal; the greatest monthly amount, 0.80, occurred at Coal Harbor, and the least, trace, at Ellendale and Forman.—*B. H. Bronson.*

Ohio.—The mean temperature was 30.2°, or 2.2° below normal; the highest was 69°, at Portsmouth on the 11th, and the lowest, 7° below zero, at Bangorville and Ridgeville Corners on the 30th, and at Hanging Rock on the 30th and 31st. The average precipitation was 3.16, or 0.49 above normal; the greatest monthly amount, 7.60, occurred at Ashtabula, and the least, 1.84, at Dupont.

Except in a few of the northwestern and north-central counties, the condition of wheat is generally unfavorable. The weather favored the growth the first part of the month, and in places the late sown improved in prospect, and the earliest seeded was recovering from the effects of the hessian fly by tillering and gaining in strength. But for the most part correspondents report the plant in poor condition to stand the winter weather. The late sown is small, and the balance is greatly weakened by the hessian fly.—*J. Warren Smith.*

Oklahoma.—The mean temperature was 38.7°, or slightly below normal; the highest was 79°, at Ryan on the 2d, and the lowest, 2° below zero at Beaver on the 15th. The average precipitation was 1.84; the greatest monthly amount, 3.61, occurred at Fort Sill, and the least, 0.20, at Beaver.

Snow afforded a fair protection to the winter wheat.—*C. M. Strong.*

Oregon.—The mean temperature, was 38.7°, or about 0.5 above normal; the highest was 68°, at Toledo on the 25th, and the lowest, 9° below zero, at Vale on the 20th. There was no marked cold spells in the section west of the Cascades; one of considerable severity prevailed over the Plateau district from the 14th to the 27th. The average precipitation was 6.30, or about 0.50 below normal; there was a deficiency west of the Cascades, and up the Columbia River Valley, while there was an excess in southwest Oregon and over the Plateau district, the latter being mostly in the form of snow. No snow fell in the western section, except close to the mountains; the greatest monthly amount, 18.48, occurred at Glenora, and the least, 0.48, at Prineville.—*G. N. Salisbury.*

Pennsylvania.—The mean temperature was 31.5°, or 0.3° above normal; the highest was 73°, at Lancaster on the 12th, and the lowest, 11° below zero, at Smethport on the 30th. The average precipitation was 3.04, or 0.18 below normal; the greatest monthly amount, 6.00, occurred at Warren, and the least, 1.18, at York.

Until the last week in December the weather conditions were favorable for the growth of winter grain. There being no protection by snow some fields were injuriously affected by alternate freezing and thawing, caused by cold nights and warm days.—*T. F. Townsend.*

South Carolina.—The mean temperature was 44.6°, or 2.3 below normal; the highest was 79°, at Beaufort on the 19th, and the lowest, 11°, at Walhalla on the 29th and 30th, at Greenville on the 30th and 31st, and at Spartanburg on the 31st. The average precipitation was 2.33, or 0.45 below normal; the greatest monthly amount, 4.05, occurred at Batesburg, and the least, 0.85, at Charleston.

Wheat and oats were in excellent condition to winter, and were not materially injured by alternate freezing and thawing. Few, if any, hessian flies noticed.—*J. W. Bauer.*

South Dakota.—The mean temperature was 18.8°, or about 3° below normal; the highest was 70°, at Forest City on the 1st, and the lowest, 26° below zero, at La Delle, Spink County, on the 31st. The average precipitation was 0.41, or about 0.47 below normal; the greatest monthly amount, 1.14, occurred at Silver City, while none fell at Gary.—*S. W. Glenn.*

Tennessee.—The mean temperature was 37.5°, or 3.5° below normal; the highest was 72°, at Waynesboro, and the lowest, 11° below zero, at

Bristol on the 31st. The average precipitation was 4.90, or 1.01 above normal; the greatest monthly amount, 12.03, occurred at Iron City, and the least, 2.01, at Newport.

The weather was, on the whole, favorable to wheat. The plant generally has good stands, is well rooted and stooled. In some eastern counties of the middle section considerable injury to early wheat by fly is reported, but altogether the prospect for wheat was better at the end of December than for many years.—*H. C. Bate.*

Texas.—The mean temperature, determined by comparison of 39 stations distributed throughout the State, was 1.8° below the normal; there was a general deficiency ranging from 1.0 to 3.8, with the greatest over the extreme western portion of southwest Texas; the highest was 90°, at Jasper on the 9th, and the lowest, 11°, at Amarillo on the 14th. The average precipitation, determined by comparison of 43 stations distributed throughout the State, was 1.25 above the normal; There was a slight deficiency over the eastern portion of north Texas, nearly normal conditions prevailed over the panhandle, west Texas, and the extreme western portion of the coast district, while over the other portions of the State there was a general excess ranging from about 1.00 to 4.23, with greatest in the vicinity of Huntsville. The greatest monthly amount, 8.06, occurred at Huntsville, and the least, 0.21, at El Paso.

The ground has been in good condition for plowing, and a great deal of this work has been done preparatory for planting spring crops. There is, however, a great deal of plowing yet to be done. There was too much rain for winter wheat in a few localities, otherwise the weather has been exceptionally favorable for the crop. Seeding was completed during the early part of December and good stands and rapid growth are reported generally. Some correspondents report that wheat prospects are better at this season than for years. Early sown has grown very rapidly and is being pastured. The acreage sown is not as great as it would have been had the weather been more favorable for this work during October and November, but the acreage is generally good.—*J. L. Cline.*

Utah.—The mean temperature was 25.2°, or 1.5° below normal; the highest was 74°, at Elgin on the 1st, and the lowest, 26° below zero, at Scipio on the 19th. The average precipitation was 0.95, or 0.04 below normal; the greatest monthly amount, 2.35, occurred at Soldier Summit, and the least, a trace, at Frisco and Pahreah.—*L. H. Murdoch.*

Virginia.—The mean temperature was 37.0°, or about 2.0° below normal: the highest was 73°, at Blacksburg on the 12th, and the lowest, 11° below zero, at Marion on the 31st. The average precipitation was 2.00, or 0.98 below normal; the greatest monthly amount, 4.06, occurred at Burkes Garden, and the least, 0.18, at Newport News.

The progress of the crops throughout the month was unusually favorable.—*E. A. Evans.*

Washington.—The mean temperature was 37.3°, or 2.7° above normal, the highest was 71°, at Bridgeport on the 9th, and the lowest, 2° below zero, at Waterville on the 18th and at Hooper on the 19th. The average precipitation was 4.79, or 0.97 below normal; the greatest monthly amount, 22.16, occurred at Clearwater, and the least, 0.58, at Ellensburg.—*A. B. Wollaber.*

West Virginia.—The mean temperature was 33.3°, or about 2.0° below normal; the highest was 77°, at Nuttallburg on the 22d, and the lowest, 17° below zero, at Green Sulphur Springs on the 31st. The average precipitation was 2.81, or 0.22 below normal; the greatest monthly amount, 4.46, occurred at Central Station, and the least, 1.22, at Parsons.—*E. C. Vose*

Wisconsin.—The mean temperature was 21.2°, or slightly above normal; the highest was 58°, at Sharon on the 8th, and the lowest, 20° below zero, at Butternut on the 29th. The average precipitation was 1.62, or 0.36 above normal; the greatest monthly amount, 2.80, occurred at Whitehall, and the least, 0.40, at Lincoln.—*W. M. Wilson.*

Wyoming.—The mean temperature was 21.1°, or 2.3° below normal; the highest was 68°, at Cody on the 25th, and the lowest, 29° below zero, at Bittercreek on the 21st. The average precipitation was 0.69, or nearly normal; the greatest monthly amount, 1.90, occurred at Centennial and at Fort Yellowstone, and the least, trace, at Cody.—*W. S. Palmer.*

SPECIAL CONTRIBUTIONS.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined list of titles has been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

Science. New York. Vol. 10.
Clayden, A. W. Dark lightning. P. 973.
Quarterly Journal of Royal Meteorological Society. London. Vol. 25.
Dickson, H. N. Mean Temperature of the Surface Waters of Sea round British Coasts and its relation to Mean Temperature of the Air. P. 227.
Schaw, H. Some Phenomena connected with the Vertical Circulation of the Atmosphere. P. 305.
Scott, R. H. Heavy Falls of Rain recorded at seven Observatories connected with the Meteorological Office, 1871–1898. P. 317.
Baxendell, J. New Self-recording Anemoscope. P. 326.
Mossman, R. C. Average Height of the Barometer in London. P. 330.
Das Wetter. Berlin. 16 *Jahrg.*
Kassner, C. Wogenwolken. P. 265.
Wirz, — Beiträge zur Klimatologie des Grossen Belchen (1394 m. Höhe). P. 283.
Geographische Zeitschrift. Leipzig. 5 *Jahrg.*
Meinardus, W. Meteorologie und Klimatologie. Der VII internationale Geographenkongress zu Berlin. P. 692.
Journal de Physique. Paris. 3me série. Tome 8.
Folgheraiter, — Sur les variations séculaires de l'inclinaison magnétique dans l'antiquité. P. 660.
Philosophical Magazine. London. Vol. 49.
Davison, Charles. Earthquake Sounds. P. 31.
La Nature. Paris. 28me Année.
Meriel, P. de. Le cyclone des Antilles. P. 107.
Plumandon, J. R. Le froid dans la France centrale. P. 93.
Scientific American. New York. Vol. 82.
—— How a Weather Map is Made. P. 38.
Comptes Rendus. Paris. Tome 129.
Poincare, A. Mouvements barométriques provoqués, sur le méridian du Soleil, par sa marche en déclinaison. P. 1290.
Scientific American Supplement. New York. Vol. 49.
Bryan, G. H. Resistance of the Air. P. 20116.
Ciel et Terre. Bruxelles. 20me Année.
Arctowski, H. Rapport préliminaire sur les recherches oceanographiques de l'Expédition antarctique belge. P. 503.
Dewert, J. L'hiver de 1740. P. 508.
Annalen der Hydrographie und Maritimen Meteorologie. Hamburg. 28 *J.*
Messerschmitt, J. B. Ueber die Halophänomene. P. 32.
Bolletino Mensuale, Soc. Met. Italiana. Turin. Ser. II. Vol. 9.
Roberts, G. I Vortici. P. 47.
Terrestrial Magnetism and Atmospheric Electricity. Baltimore. Vol. 4.
Elster, J. and Geitel, H. Ueber die Existenz electrischen Ionen in der Atmosphäre. P. 213.
Tillo, Alexis de. Sur la rélation qui existe entre la répartition des éléments magnetiques et la distribution général des mers et de la température moyenne annuelle à la surface du globe. P. 237.
Luedeling, G. Ueber die tägliche Periode des Erdmagnetismus und der erdmagnetischen Störungen an Polarstationen. P. 245.

RATIO OF THE DISCHARGES OF THE CHAGRES RIVER AT GAMBOA AND BOHIO TO THE RAINFALL IN THE WATERSHED ABOVE THESE PLACES.

By HENRY L. ABBOT, U. S. A., Engineer of the New Panama Canal Co., dated Paris, December 9, 1899.

In my note on the regimen of the Chagres River there is an almost complete collection of the monthly mean discharges, in cubic meters per second, as measured during seven years at Gamboa and Bohio. These values are here given in Tables 1 and 2. A few observations that are missing have been supplied by the figures in brackets which also enter into the mean values of the summary, except for April, 1893, at Bohio, where, because of the small flood which occurred there at that time, we have adopted ten-sevenths (1.43) of the corresponding discharge measured at that time at Gamboa.

TABLE 1.—*Monthly discharges, in cubic meters per second, as measured at Gamboa.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
1891 ...	58	27	17	15	98	67	107	79	86	126	212	145	86
1893 ...	44	39	32	110	68	77	82	161	100	101	154	274	104
1894 ...	142	36	21	16	48	70	205	133	145	133	185	301	120
1895 ...	110	[32]	31	35	81	87	89	128	107	134	110	128	89
1896 ...	101	36	18	38	126	107	74	66	77	76	[159]	145	85
1897 ...	50	21	14	26	93	67	107	116	109	99	148	212	88
1898 ...	140	27	17	56	57	44	85	61	38	[129]	113	45	68
Means	92	31	21	42	82	74	107	106	95	114	154	178	91

TABLE 2.—*Monthly discharges, in cubic meters per second, as measured at Bohio.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual mean.
1891 ...	76	39	17	17	67	91	136	128	280	96	431	630	167
1893 ...	[126]	[44]	[25]	[157]	[129]	140	216	305	217	243	324	525	204
1894 ...	300	51	31	22	95	121	176	184	211	265	360	356	173
1895 ...	129	39	30	30	118	122	130	196	164	196	172	197	127
1896 ...	134	44	25	48	140	119	89	99	168	180	215	171	119
1897 ...	58	45	20	25	226	119	145	206	195	212	197	193	137
1898 ...	169	44	35	46	67	80	174	164	104	196	244	84	117
Means	126	44	26	50	120	113	152	183	191	198	278	308	149

TABLE 3.—*Precipitation in millimeters.*

Months.	Bohio.				Gorgona.			
	1896.	1897.	1898.	1899.	1896.	1897.	1898.	1899.
January	.....	.....	.....	239	.....	.....	.....	96
February	.....	.....	32	114	.....	5	51	
March	.....	.....	77	83	.....	0	84	
April	.....	206	269	.....	.....	66	35	.....
May	397	471	371	.....	229	638	128	.....
June	217	358	502	.....	173	344	111	.....
July	141	402	888	.....	131	245	470	.....
August	.....	640	973	.....	.....	480	505	.....
September	.....	444	.....	.....	.....	406	.....	.....
October	.....	661	717	.....	.....	366	196	.....
November	.....	497	554	.....	.....	182	244	.....
December	.....	560	162	.....	.....	201	100	.....
Sums	755	4,239	4,545	436	533	2,878	1,794	231
Totals	9,975				5,436			
	Gamboa.				Colon.			
January	.....	.....	.....	137	.....	.....	.....	176
February	.....	.....	3	44	.....	.....	9	165
March	.....	.....	0	34	.....	.....	40	32
April	.....	82	36	.....	.....	95	120	.....
May	85	443	135	.....	418	415	326	.....
June	84	321	118	.....	216	478	416	.....
July	147	231	468	.....	345	357	556	.....
August	.....	437	512	.....	.....	438	277	.....
September	.....	478	.....	.....	.....	437	.....	.....
October	.....	325	221	.....	.....	148	289	.....
November	.....	150	370	.....	.....	563	312	.....
December	.....	219	61	.....	.....	480	202	.....
Sums	316	2,686	1,924	205	979	3,411	2,547	373
Totals	5,131				7,310			

As regards the ratio between the quantity of water flowing from the upper basins of the Chagres and the water falling into it, we must acknowledge that no information in our possession can inspire us with much confidence for want of an adequate number of numerous and well-distributed observations. Nevertheless, relying upon careful observations made at Colon by the engineers of the Panama Railroad during several years and including all the months in the above-mentioned tables, it has seemed to me interesting to make a study of the data actually available, in order to set forth the relation between the values at Colon and those for the rainfall stations of the company in the basin of the Chagres. By discarding all interpolations, we shall be able to make use of complete rainfall observations made at Bohio, Gorgona, Gamboa, and Colon during twenty-five months only, the values of which are given in Table 3.

Gamboa and Gorgona are situated near together in the basin of the Lower Chagres not far from the Pacific Ocean. Bohio is in the same basin, but nearer the Atlantic Ocean. Consequently the mean rainfall of these two regions may be considered as that of the basin including that of the canal. As regards the Upper Chagres above Gamboa, it must be observed that the course of the river is nearly parallel to the Atlantic coast, and quite near to it. Thus the assumption of an equal rainfall in this region and at Colon is quite reasonable. The following is a comparison between the rainfalls based on the above figures:

Rainfall at Colon during the 25 months..... 7,310 mm.

Rainfall in the valley of the Chagres River=

$$\frac{9,975}{2} + \frac{5,436+5,131}{4} = 7,629 \text{ mm.}$$

By increasing these figures slightly I think we may adopt the rainfall at Colon as representing the average rainfall in the basin of the Chagres above Bohio without departing too far from the truth. If this assumption is well founded, we have the necessary data for studying the ratio of the quantity of water flowing in the bed of the river to the quantity of water falling into its basin above Bohio during the seven years whose monthly amounts are given above. The following values are taken from my note on the climatology of the Isthmus:

TABLE 4.—*Precipitation at Colon, in millimeters.*

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Sums.
1891 ...	64	13	38	13	584	203	356	406	444	444	495	108	3,168
1893 ...	44	97	46	205	167	313	292	384	252	312	452	786	3,350
1894 ...	136	42	9	55	250	311	485	585	477	315	601	638	3,904
1895 ...	98	48	53	552	426	235	434	359	307	418	520	399	3,849
1896 ...	102	33	51	229	418	216	345	394	326	355	397	474	3,340
1897 ...	87	1	7	95	415	478	357	438	437	148	563	480	3,506
1898 ...	128	9	40	120	326	416	556	277	260	289	312	202	3,025
Means	94	35	35	181	369	310	403	406	358	326	477	441	3,449

The areas of the basins above Bohio and Gamboa being 670 and 420 square miles, respectively, the ratio between the rainfall and the water flowing in the bed of the river may be computed month by month. For example, we find at Bohio in July:

$$\frac{\text{Discharge of the Chagres at Bohio in July}}{\text{Rain falling into its basin}} = \frac{152 \times 3,600 \times 24 \times 31}{0.403 \times 670 \times 1.610^2} = 0.58.$$

In this way the ratios in Table 5 are determined.

TABLE 5.

Months.	Ratio.		Months.	Ratio.	
	Bohio.	Gamboa.		Bohio.	Gamboa.
January	2.07	2.41	May	0.50	0.55
February	1.39	1.97	June	0.54	0.57
March	1.15	1.48	July	0.58	0.65
April	0.46	0.54	August	0.70	0.64
			September	0.80	0.63
			October	0.94	0.86
			November	0.87	0.77
			December	1.08	0.99
Seasonal averages	1.27	1.60	Seasonal averages	0.75	0.71

Annual average at Gamboa, 1.00; annual average at Bohio, 0.92.

Without placing too great reliance on these figures, we may, from the well-marked differences between the results for the dry season and those for the rainy season, conclude that during the rainy season the Chagres must receive a great deal of water from the soil by infiltration. This is ordinarily the case with rivers flowing through similar regions. In fact, we already knew this by observing considerable outflows of water occurring in January, although there were no rains. This condition is very advantageous to the canal as regards the supply of water for the summit level during the dry season.

It may be further remarked that these annual mean ratios agree well with results well known in the United States, where the following figures are accepted:*

For rivers flowing from mountains or steep, rocky hills...	0.80 to 0.90
In forests and swampy regions.....	0.60 to 0.80
In undulating meadows with forests	0.50 to 0.70
In cultivated flat prairies.....	0.45 to 0.60

Fig. 1 represents the outflow and the amount of rainfall given by the above tables and the correlated positions of the sun in its annual course.

ADDENDUM, DATED DECEMBER 14, 1899.

During the current year observations have been resumed at Alhajuela, including daily measurements of discharge, automatic water level records, the rainfall, and hourly registrations by a self-registering thermometer and barometer. The usual records have been continued at Gamboa and Bohio. Rating tables, giving the discharges corresponding to the the different water levels, have been prepared at all three posts based for Alhajuela on over 350, for Gamboa on over 1,450, and for Bohio on over 1,000 actual gagings. As a check on the daily discharge measurements the volumes are computed, from these rating tables, at two-hourly intervals, thus correcting for any sudden changes in water level by day or by night, and determining the discharge with extreme accuracy.

These more elaborate discharge determinations, together with the additional rainfall observations at Alhajuela, furnish data for a more exact estimate of the ratio between rainfall and drainage than was possible in the foregoing study. The automatic water levels and the rainfall observations at Alhajuela were begun last June, and the numerical data to date (the mean monthly discharge in cubic meters per second, and the monthly rainfall in millimeters) are given in the following table:

TABLE 6.

Month.	Bohio.		Gamboa.		Alhajuela.		Colon.
	Discharge.	Rainfall.	Discharge.	Rainfall.	Discharge.	Rainfall.	Rainfall.
1899.							
July	112	451	73	240	61	297	763
August	162	330	113	278	91	259	376
September	120	226	83	342	66	205	186
October	140	491	89	202	73	301	382

The desired ratio between precipitation and drainage at Bohio (and similarly at Gamboa) has been found by dividing the mean monthly discharge there, as determined at two-hourly intervals, by the sum of the products of the mean rainfall at Bohio and Gamboa, at Gamboa and Alhajuela, and at Alhajuela and Colon multiplied by the areas of their several basins. The results for the four months now available are in so good accord with the above 7-year table, that its general trustworthy character seems to be confirmed, as appears from the figures in Table 7.

*Hydraulic and Water Supply Engineering. By J. T. Fanning, C. E., page 77.

TABLE 7.

Month.	Ratio at Bohio.		Ratio at Gamboa.	
	Calculated.	Above table (mean of 7 years).	Calculated.	Above table (mean of 7 years).
1899.				
July	0.42	0.58	0.40	0.65
August..... . .	0.84	0.70	0.94	0.64
September	0.73	0.80	0.90	0.63
October.....	0.65	0.94	0.68	0.86
Means.....	0.66	0.75	0.73	0.70

But a knowledge of the discharge at these three important posts enables the value of the ratio between downfall and drainage to be computed, independently, for the two basins lying between Bohio and Gamboa, and between Gamboa and Alhajuela, of which the areas are more accurately known than that of the Upper Chagres. Moreover, the rainfall having been noted at each of their extremities, the mean values are probably better determined. These local ratios, based on the contributions of the lower tributaries and the corresponding rainfall, are found to be the following: For the basin between Bohio and Gamboa (250 square miles), in July it was 0.47; in August, 0.66; in September, 0.52; and in October, 0.61, giving a mean of 0.57. For the basin between Gamboa and Alhajuela (130 square miles), it was in July 0.36; in August, 0.65; in September, 0.48, and in October, 0.45, giving a mean of 0.49. Thus, in whatever way computed, the numerical value of this ratio in the valley of the Chagres varies only within limits usual in such districts, and thus indirectly furnishes a new confirmation of the accuracy which characterizes the hydraulic and other investigations of the New Panama Canal Company.

COMPARATIVE RAIN GAGE READINGS AT ATLANTA, GA.

By ALFRED J. HENRY, Chief of Division.

A series of comparative measurements of the rainfall at several points in Atlanta, Ga., extending over eleven months, has just been completed.

The Weather Bureau Office in that city was moved to the United States Customhouse, May 1, 1891. The customhouse is provided with a hip roof, surmounted by a tower. The wind instruments were given a satisfactory exposure on the top of the tower, but it was not possible to secure a position for the rain gage that should be fully removed from the influence of the tower. It was known that the position of the gage was faulty and gave deficient measurements of precipitation with northeast winds, but the amount of the deficit was a matter of conjecture until after the recent comparative measurements were begun. A rain gage was taken to the residence of the official in charge of the station, about a mile northeast of the customhouse, and given a good ground exposure. The measurements at the two locations, customhouse and the residence of the official in charge, (which for convenience will be designated A and B, respectively), were as follows: February 1899, A, 6.62 inches; B, 7.88 inches. March, A, 5.38 inches; B, 7.06 inches. April, A, 1.71 inches; B, 2.09 inches. The discrepancy between the catch at A and B, respectively, may be attributed in part to the effect of the tower at A, and in part to the fact that ground exposures catch, on the average, from 5 to 10 per cent more rain than roof exposures.

In May, 1899, an option was secured on quarters in the Prudential Building, which, it may be remarked, is provided with a flat roof and offers fairly good exposures for the various instruments used by the Weather Bureau, but the removal of the station to the Prudential Building was not accomplished until July 1, 1899.

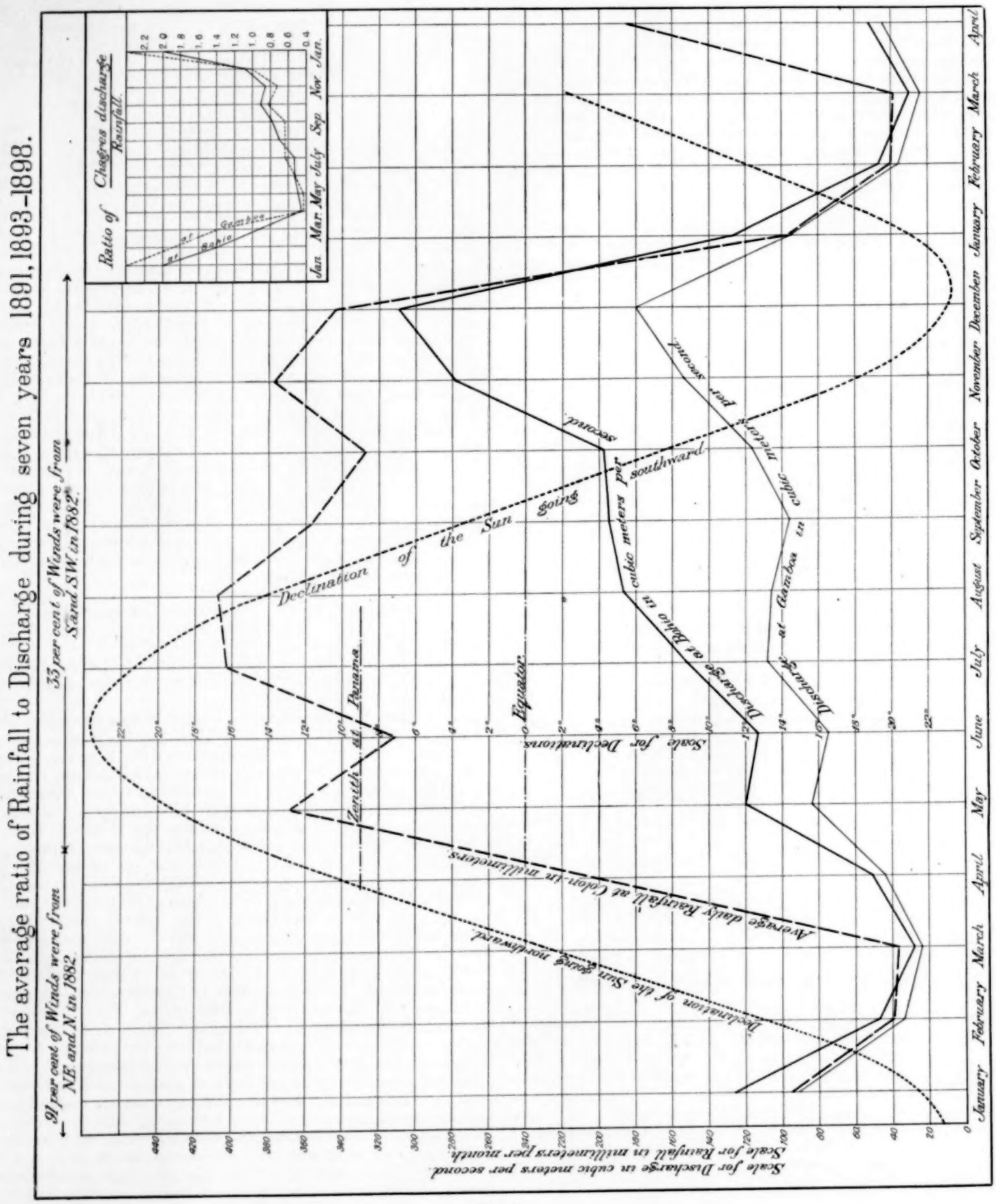

The average ratio of Rainfall to Discharge during seven years 1891, 1893–1898.
Ratio of Chagres discharge / Rainfall.
Jan Mar May July Sep Nov Jan.
Declination of the Sun going southward
Declination of the Sun going northward
Average daily Rainfall at Colon in millimeters
Discharge at Bohio in cubic meters per second
Discharge at Gamboa in cubic meters per second
Zenith at Panama
Equator
Scale for Declinations
Scale for Discharge in cubic meters per second.
Scale for Rainfall in millimeters per month.
January February March April May June July August September October November December January February March April
35 per cent of Winds were from SE and SW in 1882.
11 per cent of Winds were from NE and N in 1882.

FIG. 1.

Comparative readings between the gage on the customhouse and the roof of the Prudential Building were begun on May 1, 1899, and continued until the end of the year. The catch of the gage on the Prudential Building seems to be about 21 per cent larger than that of the gage on the customhouse. The monthly amounts in the two locations, viz., customhouse, A, and Prudential Building, B, are as follows: May, A, 1.21 inches; B, 1.44 inches. June, A, 1.46 inches; B, 1.56 inches. July, A, 4.68 inches; B, 6.42 inches. August, A, 2.14 inches; B, 3.11 inches. September, A, 2.21 inches; B, 2.27 inches. October, A, 3.19 inches; B, 3.71 inches. November, A, 2.36 inches; B, 2.65 inches. December, A, 3.71 inches; B, 4.15 inches.

The record of precipitation at the Atlanta station from May 1, 1891, to the date of removal to the Prudential Building is probably deficient by amounts varying from 15 to 20 per cent of the recorded catch, or 25 per cent of the true rainfall.

MEXICAN CLIMATOLOGICAL DATA.

Through the kind cooperation of Señor Manuel E. Pastrana, Director of the Central Meteorologico-Magnetic Observatory, the monthly summaries of Mexican data are now communicated in manuscript, in advance of their publication in the Boletin Mensual. An abstract, translated into English measures, is here given, in continuation of the similar tables published in the MONTHLY WEATHER REVIEW since 1896. The barometric means have not been reduced to standard gravity, but this correction will be given at some future date when the pressures are published on our Chart IV.

Mexican data for November, 1899.

Stations.	Altitude.	Mean barometer.	Temperature. Max.	Min.	Mean.	Relative humidity.	Precipitation.	Prevailing direction. Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Colima	.....	.....	90.9	59.5	76.6	.....	.....	.....	.....
Culiacán Rosales (E. d. S.)	112	29.73	96.6	54.5	75.7	51	0.67	w.	s.
Leon (Guanajuato)	5,934	29.95	75.9	34.3	58.6	56	0.14	nnw.	sw.
Merida	50	29.93	95.4	57.9	75.7	73	0.29	ne.	e.
Mexico (Obs. Cent.)	7,472	23.04	72.5	39.6	57.0	61	0.43	nw.	ne.
Morelia (Seminario)	6,401	23.95	76.1	41.7	59.2	69	0.04	wsw.	w.
Saltillo (Col. S. Juan)	5,399	24.78	75.2	37.2	54.5	67	0.62	s.	sw.
San Isidro (Hac. de Guanajuato)	.....	.....	68.0	51.8	.....	.....	0.25	.....	.....
Silao	6,063	24.27	72.9	42.3	61.3	56	0.35	wsw.	sw.
Zapotlan (Seminario)	5,078	25.09	80.8	42.4	63.3	61	T.	se.	se.

Mexican data for December, 1899.

Stations.	Altitude.	Mean barometer.	Temperature. Max.	Min.	Mean.	Relative humidity.	Precipitation.	Prevailing direction. Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	° *F.*	° *F.*	%	*Inch.*		
Culiacán Rosales (E. d. S.)	112	29.78	87.4	53.2	70.0	61	4.48	w.	.....
Durango (Seminario)	6,243	24.06	78.8	26.6	54.3	49	0.64	sw.	w.
Leon (Guanajuato)	5,934	24.32	75.9	32.5	56.1	50	0.04	sse.	sw.
Mexico (Obs. Cent.)	7,472	23.06	71.1	35.6	54.7	51	T.	nw.	ne.
Morelia (Seminario)	6,401	23.98	75.6	39.9	57.7	61	.....	ene.	sw.
Puebla (Col. Cat.)	7,112	23.39	73.9	34.7	57.9	73	.....	ene.	sw.
Saltillo (Col. S. Juan)	5,399	24.80	70.3	29.3	49.8	66	1.03	s.	sw.
San Isidro (Hac. de Guanajuato)	.....	.....	68.0	54.5	.....	.....	.....	.....	.....
Silao	6,063	24.30	72.3	41.9	58.3	52	T.	wsw.	w.
Zapotlan	5,078	25.11	79.5	42.3	61.3	57	0.18	se.	w.

DATE OF COLD FRIDAY.

By ALFRED J. HENRY, Chief of Division.

A correspondent writing from Columbus, Ohio, asks us to fix the date of Cold Friday. Our correspondent remarks that his grandfather was buried on that day in Jefferson County, Ohio, about the year 1806. We infer, therefore, that the term Cold Friday must refer to a day of extreme cold that was felt in Ohio, at least, and over we know not how much greater extent of territory. Meteorological observations were not made west of the Alleghenies in 1806, or for a number of years thereafter. On the eastern fringe of the United States there was no remarkably cold weather in 1806, but there was a cold spell in 1807, and another of greater severity in 1809. In looking over the available lists of dates of great cold we find a reference to Cold Friday in a report of the weather previous to 1830, compiled by the late Major W. H. Gardner, of Mobile, Ala. Major Gardner states that February 7, 1807, was known for many years as Cold Friday by reason of the low temperature reached that day. The location of the great cold is given as the Middle States.

Further information respecting the intensity of the cold experienced and its geographical distribution will be gladly received.

OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made partly in accordance with the new form, No. 1040, and the arrangement of the columns, therefore, differs from those previously published.

Meteorological observations at Honolulu, December, 1899.

The station is at 21° 18′ N., 157° 50′ W.

Pressure is corrected for temperature and reduced to sea level, and the gravity correction, −0.06, has been applied.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force or amounts of cloudiness, connected by a dash, indicate change from one to the other.

The rainfall for twenty-four hours has always been measured at 10:29 p. m., not 1 p. m., Greenwich time, on the respective dates.

The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Date.	Pressure at sea level.	Temperature. Dry bulb.	Temperature. Wet bulb.	During twenty-four hours preceding 1 p. m., Greenwich time, or 2:29 a. m., Honolulu time. Temperature. Maximum.	Temperature. Minimum.	Means. Dew-point.	Means. Relative humidity.	Wind. Prevailing direction.	Wind. Force.	Average cloudiness.	Sea-level pressures. Maximum.	Sea-level pressures. Minimum.	Total rainfall at 9 a. m., local time.
	*	†	†			‡	‡		§				
1	29.94	63	62.5	80	66	64.0	73	ne.	3	2	30.03	29.92	0.00
2	29.93	62	61	81	63	63.3	76	sw-n.	1-0	3	30.01	29.88	0.00
3	29.96	62	60.5	79	61	62.0	78	sw-n.	1-0	2	30.06	29.94	0.00
4	29.97	72	64.5	80	61	61.7	73	nne.	1-0	1-0	30.01	29.92	0.00
5	30.03	68	66.5	81	67	61.0	66	ne-sw.	2-0	5	30.06	29.93	0.01
6	30.06	73	63	78	65	63.0	74	ne.	0-1	8-3	30.08	29.99	0.00
7	30.06	72	65	78	67	59.0	57	ne.	3	3	30.10	29.99	0.00
8	29.98	66	62	79	71	62.7	67	ne.	3	5	30.09	29.96	0.00
9	29.95	65	61.5	81	65	62.7	69	se-w.	2	3	30.05	29.94	0.00
10	29.87	67	63.5	80	64	61.5	70	s.	1-0	4	29.99	29.85	0.00
11	29.90	68	66.5	78	66	66.0	81	w-s.	1-0	6-10	29.94	29.85	0.02
12	29.91	72	68	78	68	66.3	79	nne.	0-3	6-3	29.97	29.87	0.01
13	29.88	70	67.5	80	71	64.7	74	nne.	2-0	2	29.98	29.87	0.00
14	29.82	69	65	81	67	65.5	75	sw.	2-0	1-10	29.91	29.82	0.00
15	29.82	65	63	83	68	64.3	76	sw-n.	2-0	1	29.88	29.79	0.00
16	29.86	72	69	82	64	64.7	78	se-sw.	1	2	29.92	29.84	0.02
17	29.90	63	62	81	67	68.5	81	s-w.	1	6	29.93	29.85	0.12
18	29.91	62	61	79	62	63.7	80	w.	1-0	2-0	29.94	29.85	0.00
19	29.95	62	61	79	61	60.7	74	sw.	1	1	29.98	29.87	0.00
20	29.98	69	65	83	61	63.5	77	se.	1	4	30.04	29.94	0.01
21	29.98	64	62	80	67	64.5	75	se.	1	4	30.04	29.94	0.00
22	29.99	68	62	81	63	62.5	74	sw-w.	1-0	0-2	30.04	29.96	0.00
23	30.03	69	64.5	82	63	61.7	66	ne.	1	1	30.08	29.97	0.00
24	29.99	73	66	80	65	60.3	63	nne.	2-2	1-3	30.08	29.96	0.01
25	29.93	70	64	79	72	62.3	65	ne.	3-5	3	30.04	29.93	0.00
26	29.81	70	65	79	67	62.0	68	ne-se-n.	2-0	2-10	29.94	29.79	0.01
27	29.80	63	61.5	78	65	62.5	76	nw-se.	1-0	10-0	29.84	29.74	0.00
28	29.81	72	65.5	81	62	61.5	70	se.	2	1-9	29.86	29.74	0.00
29	29.74	70	69	78	70	64.5	73	se.	2	10-9	29.86	29.73	0.10
30	29.75	69	68	79	69	69.7	87	s-sw.	2	10	29.80	29.72	1.44
31	29.79	65	61	78	68	68.7	85	nw-sw.	2-0	10-4	29.84	29.73	0.00
Sums	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.75
Means	29.913	67.7	64.1	79.8	65.9	63.5	73.6	.....	1.3	4.0	29.979	29.873	....
Departure	−.037	.....	.....	.....	.....	+1.0	−0.3	.....	.....	0.0	.....	.....	−2.91

Mean temperature for December, 1899 (6+2+9)÷3=72.°1; normal is 71.5°. Mean pressure for December (9+3)÷2 is 29.926; normal is 29.963.

*This pressure is as recorded at 1 p. m., Greenwich time. †These temperatures are observed at 6 a. m., local, or 7:29 p. m., Greenwich time. ‡These values are the means of (6+9+2+9)÷4. §Beaufort scale.

OBSERVATIONS AT RIVAS, NICARAGUA.

The records contributed for many years by Dr. Earl Flint, at Rivas, Nicaragua, include barometric readings. His present station is at 11° 26′ N., 85° 47′ W. The observations at 7:17 a. m., local time, are simultaneous with Greenwich 1 p. m. The altitude of the barometer is now said to be 4 feet above ground; the thermometer 6 feet above ground; the rain gage 7 feet above ground. The ground is 210 feet above sea level. Until the barometer has been compared with a standard it seems hardly necessary to publish the daily readings. The wind force is recorded on the Beaufort scale, 0–12. When cloudiness is less than $\frac{1}{10}$, the letter "F," or "Few," is recorded.

Simultaneous observations at 1 p. m. Greenwich (or 7:17 a. m. local) time December, 1899.

Date.	Temperature.		Wind.		Upper clouds.			Lower clouds.		
	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.
	°	°								
1	73	72	se.	0	cs.	5	se.	k.	few.	se.
2	74	72	ne.	0	.. ..	... ...	.....	k.	10	ne.
3	75	74	e.	3	.....	.....	.....	k, k.*	0	e.
4	75.5	70	ne.	3	.....	.....	....	ak.	1	ne.
5	74.5	67	ne.	7	.....	.....	.....	ks.	5	ne.
6	75	71	ne.	4	.....	.....	.....	fk.	2	ne.
7	78	74	ne.	3	.....	.....	.....	fk.	10	ne.
8	78	74	e.	3	cs.	10	ne.	k. k.*	few.	e.
9	77.5	74	se.	3	....	.....	.....	ak, ks.	1, 9	se.
10	77	74	se.	0	cs.	3	.....	k.	7	se.
11	75.5	70	ne.	3	.....	.....	.....	k.	10	ne.
12	77	73	ne.	4	cs.	4	sw.	k.	1	ne.
13	78	74	se.	2	.....	.....	.....	k.	10	se.
14	78	74	ne.	4	cs.	2	se.	k.	3	ne.
15	77	73	ne.	6	cs.	1	sw.	k, k.*	.....	ne.
16	76	72	ne.	6	cs.	Few.	se.	ak, k.	1	sw.
17	76	72	se.	5	.....	.....	.....	fk.	8	se.
18	76.5	71	se.	6	.....	.....	.....	fk.	few.	se.
19	76	70	se.	7	.....	.....	....	ak, ks.	2, 8	se.
20	76	70	se.	7	.....	.....	....	ak, fk.	7	se.
21	75	69	ne.	5	.....	....	.....	k.	few.	ne.
22	73.5	68	ne.	4	.....	.....	.....	k, k.*	0	ne.
23	73	68	ne.	3	.....	.....	.....	ks.	few.	ne.
24	74	69	ne.	3	.....	.....	.....	k, k.*	0	ne.
25	74.5	67	ne.	3	.....	.....	.....	k.	few.	ne.
26	74	67	se.	3	.....	.....	.....	k.	8	se.
27	74	67	s.	6	.....	.....	.....	fk.	7	e.
28	77.5	71	se.	4	.....	.....	.....	fk.	8	se.
29	76	70	ne.	4	.....	.....	.....	fk.	5	ne.
30	75.5	67	e.	6	cs.	Few.	s.	fk.	6	e.
31	76.5	70	ne.	4	....	.....	.....	k.	7	ne.
Means	75.7	.....	.....	...	.....	.....	.....	.....	.....	.....
Departure	−1.18	.....	.....	.....	.....	.....	.....	.....	.....	.....

*On Ometepe.

This station is situated on the western shore of Lake Nicaragua, not far from the eastern end of the western division of the proposed Nicaragua Canal. The volcano Ometepe, on an island in Lake Nicaragua, is about 10 miles northeast of the station. Dr. Flint's records occasionally mention the presence of clouds on the summit of this mountain.

Dr. Flint's reports to the Weather Bureau now embrace two distinct features, namely, the simultaneous morning observations and the daily climatological summary, as given in the two accompanying tables for each month.

Climatological observations for twenty-four hours ending at 7:17 a. m. local (or 1 p. m. Greenwich) time, December, 1899.

Date.	Temperature.		Wind.		Average cloudiness.	Total rainfall.	Rainfall at Sapoa.
	Maximum.	Minimum.	Prevailing direction.	Maximum force.			
	°	°				*Inches.*	*Ins.*
1	80	72.5	sw, ne.	3	7	0.06	0.05
2	81	70	sw.	3	5	0.04	0.42
3	81	73	ne.	5	3	0.00	0.01
4	82	74	e.	4	Few.	0.00	0.07
5	84	75	ne.	6	5	0.00	0.00
6	84.2	74	ne.	7	6	0.00	0.00
7	85.5	74	ne.	7	6	0.00	0.19
8	85	78	ne.	5	4	0.00	0.02
9	85.5	77	e-ne.	5	6	0.02	0.49
10	86	76.5	se.	4	6	0.04	0.08
11	85	77	se.	3	7	0.24	0.02
12	82	75	ne.	4	10	0.00	0.01
13	86.5	76	ne, e.	4	3	0.00	0.04
14	86	77	ese.	3	9	0.02	0.01
15	84.5	77	ne.	4	7	0.00	0.04
16	83	76	ne.	6	2	0.01	0.80
17	85	75	ne.	6	3	0.00	0.00
18	83	75.5	se.	6	7	0.00	0.05
19	84	76	se.	7	5	0.20	0.34
20	82.2	75	se.	7	6	0.00	0.41
21	82.4	75	ese.	7	2	0.00	0.03
22	83	74.2	e-ne.	5	2	0.06	0.01
23	83	73	ne.	4	2	0.13	0.00
24	82.5	73	ne.	4	3	0.00	0.00
25	84.1	73.5	ne.	3	1	0.00	0.00
26	83.8	74	ne.	5	1	0.00	0.00
27	82	74	ese.	7	7	0.00	0.02
28	83	74	e.	6	5	0.00	0.00
29	84	76	se.	5	5	0.00	0.03
30	86.3	75	ne.	5	3	T.	0.04
31	85.5	75	e.	6	2	0.00	0.00
Sums	.....	.....	.....	.....	.....	0.82	1.98
Means	83 7	74.8	.....	5	4.5	.....	.....
Departures	.....	.....	.....	.....	.....	−0.43	.....

NOTE.—Mr. Flint gives the total rainfall at Sardinas for December 1 to 22, inclusive, as 1.70. The total annual rainfall for 1899 at Rivas is 65.86, and at Granada 60.32. On the 21st, at 5:30 p. m., a seismic movement north and south shook the doors for three seconds.

NOTES BY THE EDITOR.

HISTORY OF THE BAROMETER.

On page 468 of Ciel et Terre for December, 1899, Mr. Lancaster reprints from the Bulletin of the Belgian Academy a recently discovered, and almost unknown letter, written by Descartes, together with a note added by the well-known historian G. Monchamp, a member of the Royal Academy of Belgium. We translate the whole, as follows:

LETTER FROM DESCARTES TO FATHER MERSENNE.

EGMOND, *December* 13, 1647.

It is now some time since M. de Zuglichen sent me the little work of M. Pascal entitled "Nouvelles, etc." "New experiments relative to the vacuum," for which I have to thank the author, since it was really sent to me by him. He seems there to wish to combat my idea of a subtile form of matter, and I am very much obliged to him. But I pray him not to forget to put forward his best arguments on this subject, and not to think hardly of me if, at the proper time and place, I explain all that I judge necessary for my defense. You ask me for some account of the experiments with quicksilver, and nevertheless you do not tell me what they are, but seem to think that I ought to divine. But I ought not to take any chances in this, because if I hit upon the truth one might think that I had already tested it by experiment, and if I make a mistake one might form a less favorable opinion of me. But if you will tell me frankly all that you have observed, I shall be under many obligations to you, and in case that I make use of this information I shall not forget to whom the credit is due. I had already requested Pascal to determine, by experiment, whether the mercury rises as high when on top of a mountain as when at the bottom. I do not know whether he has made the experiment, but in order that we may find out whether the changes of weather and location have any effect, I send you a strip of paper two and a half feet long on which the third and fourth inches above the 2-foot mark are divided into lines. I will retain another similar piece here, so that we shall be able to see whether our observations accord one with the other. I, therefore, pray you to observe, both in cold and in warm weather, and when the wind blows from the north and from the south, to what division on this scale the quicksilver rises. In order that you may know whether you find any difference and that you may be induced to send me your observations freely, I must tell you that on Monday last the mercury attained the height of exactly 2 feet and 3 inches on this measuring scale, and that yesterday, which was Thurs-

day, it went a little above 2 feet 4 inches; to-day, however, it has fallen three or four lines. I have a tube which remains fastened day and night in the same spot, in order to make these observations. I think, however, that it will be better not to publish these latter at present but to wait until Pascal's book has come out.

I wish also that you would try to light a fire in your vacuum, and that you would observe whether the smoke goes up or down, and what shape the flame has. One can make this experiment by putting a little sulphur or camphor at the end of a thread in the vacuum,* and then setting it on fire through the glass by means of a mirror or burning glass. I cannot make this experiment here because the sun is not warm enough, and I have not yet been able to get the tube adjusted with the bottle. [i. e. the vacuum bulb.—C. A.] I am astonished that you have kept this experiment, as Pascal says, to yourself for four years without having ever said a word to me about it, and that you should not have begun to try it before this present summer, for as soon as you mentioned it to me I judged that it was a matter of importance, and that it might be of great service in verifying what I have written on physics.

COMMENTS ON THE PRECEDING LETTER.

By G. MONCHAMP.

Such is this "lost" letter of Descartes so interesting in the history of science, and wherein he reveals so clearly his own character, his relations with Pascal, his desire to be kept informed of all the novelties in science, and, what is still more remarkable, his fear of announcing *a priori* ideas that might be contradicted by experiment, or, if confirmed, his fear of being suspected of having predicted them after having first tried them experimentally.

We remark also that Descartes states that he had recommended Pascal to determine by experiment whether the mercury rose as high when on the top of a mountain as when at the bottom. Pascal, at the time when Descartes wrote to him about making this observation, had not yet done so, but, on the 15th of November, 1647, he had asked his brother-in-law, Périer, to try it at Clermont. We see here that Descartes claims the idea of this experiment as his own, at least he states that he suggested it to Pascal. The latter had pretended that the idea came spontaneously from himself. This letter from Descartes, added to other documents, proves that Pascal was mistaken.

According to the obvious meaning of the letter above given, it would seem clear that on December 13, 1647, Descartes not only did not know that Pascal had written to his brother-in-law requesting him to make the experiment on Puy-de-Dôme, but he did not even know that he had any intention of so doing. On the other hand Pascal, in the text which he himself gives of the letter of November 16, 1647, to his brother-in-law, states very clearly that Father Mersenne had communicated this intention to Descartes. He says:

> Upon this assurance (that you will oblige me by making this experiment on the Puy-de-Dôme yourself) I have led all our friends in Paris to look forward to it, and among others *Father Mersenne who has already pledged himself by letters that he has written on this subject* to Italy, Poland, Switzerland, Holland, etc., to inform *the friends whom he has made in those countries.*

We see also by this "unpublished" letter that Descartes was the first to add a graduated scale to the barometer and to undertake regular observations with it.

Pascal seems not to have known about the variations in height of the mercurial column, when kept in the same locality, until after the publication of the experiment on Puy-de-Dôme (which took place September 19, 1648). He did not communicate anything about it to Périer until shortly after that time, as stated by the latter:

> After I had made the experiment on the Puy-de-Dôme, as above related, Mr. Pascal wrote me from Paris to Clermont where I then was, that not only the change of location (that is to say of altitude) but also the changes of weather at the same place, according as it is more or less cold or warm, wet or dry, causes different elevations and depressions of the mercury in the tube.

*The vacuum chamber was apparently a large bulb blown at the upper end of the barometer tube.

Périer afterward says that he began making regular observations, that he compared them with others made in distant places at the same time, etc. In a word, he speaks and acts in the manner indicated by Descartes, as is shown by our letter and by other letters that have been recently discovered.

We know that on the death of Mersenne (September 1, 1648,) Roberval, the friend of Pascal, seized upon the letters from Descartes to Mersenne which were found in the cell of this monk.

The letter of Descartes on the barometer seems to have been afterward passed from one person to another, for M. Tannery has, it seems to us, demonstrated that it was not revised by Lahire, who had, however, come into possession of those letters left by Roberval in 1675, the year of his death.

In a word, we are led to believe that Pascal in this present case also profited by Descartes.

Finally we will recall that at the beginning of his little pamphlet, Pascal says:

> It is now about four years since the glass tube was first tried in Italy. * * * This account of the experiment having been sent from Rome to Father Mersenne, a monk in Paris, he published it in France in 1644, to the great admiration of all the scientists.

This sentence explains the astonishment expressed by Descartes when he says to Father Mersenne, toward the end of his letter:

> I am astonished that you have, as Pascal says, kept this experiment to yourself for four years without having said a word to me about it, and without having begun to try it until this summer.

This omission on the part of Mersenne, who was ordinarily very communicative, is partly explained by the failure of the attempts made by him to renew the experiment of Torricelli. Pascal wrote to M. de Ribeyre on this subject as follows:

> Father Mersenne tried to repeat it in Paris, and not having made a complete success, stopped it and thought no more of it. Afterwards, going to Rome on some other business, he found out exactly how to do it, and returned with full instructions. The news of this having reached us, in 1646, at Rouen, where I was at the time, we made this Italian experiment following the memoir of Father Mersenne.

These two accounts by Pascal do not entirely agree, and neither of the two contains the exact truth.

Mersenne returned from Italy in July, 1645, tried the experiment again with M. Chanut, and they both tried to reproduce the phenomena, but again failed. Mersenne then had recourse to Petit in September, 1646, and this time he was successful. (*See* Adam, "*Pascal and Descartes.*")

It is, nevertheless, astonishing that Father Mersenne should have waited almost a year longer without informing Descartes of the great scientific news which had come from Italy. Could Mersenne have positively concealed from Descartes his experiment of 1646?

The manuscript of the letter which we have reproduced seems to have been lost. Notwithstanding the searches recently undertaken, it had not yet been found in 1898, and we do not know that it has been since.

"TULE FOG."

In our search for local meteorological terms not widely known, but sometimes worthy of broader usage, we have come upon the expression "tule fog" as used by Mr. McAdie in a recent number of the Report of the California Section.

According to the botanical dictionary "tule" is a species of bulrush occupying large areas of swamp and overflowed bottom lands in California. Of course, therefore, we infer that "tule fog" is meteorologically equivalent to fogs over marshes and swamps, or the fogs of the lowlands and the valleys. It is essentially due to the cooling by radiation during clear nights. At first the vegetation cools by its own radiation; then the adjacent air cools by contact with the

leaves and branches; after this cool air has settled quietly to the ground it cools still further by its own radiation and by contact with the cooling grass and leaves until fog is formed; the particles of fog then cool by their own radiation and thus the layer of cold air grows upward and the fog grows higher and higher until a little after sunrise.

Observers who look down upon such marshes and valleys from elevated stations would do well to keep a record of the depth of the accumulated layer of fog by noting the points that are still uncovered at its upper edge.

THE "GRAN CULTURA" IN PUERTO RICO.

As the term "Gran Cultura" has no single English equivalent and must, therefore, be bodily transferred from Puerto Rican usage into local English, we take pleasure in publishing the following letter explaining the meaning of the term:

LUQUILLO, PUERTO RICO, *Dec.* 11, 1899.

Dr. GEDDINGS,
Weather Bureau, San Juan.

DEAR SIR: In reply to your question as to the generally accepted translation of the expression "Gran Cultura," I can only tell you we never have used anything here except the two words themselves. There are two or three ways of applying them, but they all work out to the same end and mean, literally, the canes planted during the autumn of one year (say 1898) for grinding early in the second season after (or say in 1900). It may have some reference also to the fact that such canes very naturally get much more cultivation than those of shorter growth. However, I can only reiterate, it is as customary for us to speak of "Gran Cultura" when speaking to others than Spanish speaking people, as it is to apply to any general English term, and I have never heard anything else down here. In comparing with other West Indian islands it might not apply, as we do not all grind at the same season.

Yours, very faithfully,

ARTHUR C. HANSARD.

SCIENTIFIC ASSISTANTS.

The following extract from pages 64–67 of the Report of the Secretary of Agriculture for the year ending June 30, 1899, illustrates the difficulty that has been experienced by every bureau and division in this great Department and in none more so than the Weather Bureau. The steps that have been taken by Secretary James Wilson to secure men having the requisite special education must commend themselves to every one, and will, we hope, stimulate the development of the land grant and agricultural colleges, and also tend to bring their best graduates on to Washington for further study and a broader field of usefulness.

The great prosperity of the country at the present time has resulted among other things in a largely increased attendance upon our universities, colleges, and other institutions of learning. When we consider that half the people of the United States are occupied in producing from the soil directly, that about three-fourths of our exports to foreign countries come from the soil, and that the $600,000,000 balance of trade coming to the United States during the last two fiscal years has been, to a great extent, the price of farm products, it is somewhat remarkable that so very little attention is given to the education of half the people of the nation and their preparation for their future life work.

The beautiful valleys of the mountain and Pacific coast States are being injured to a considerable extent by the injudicious use of irrigating waters. The pasture lands of the public domain west of the Missouri River are being rapidly destroyed by injudicious grazing. The wheat-growing area of the country, where crops are grown continuously, are refusing to yield as they did when first brought under cultivation, and from the Dakotas to the Pacific we find systems of fallowing in operation and crops of wheat being taken once in two years, indicating the rapid destruction of the plant food in the soil.

The people cry aloud to this Department for help. We have gone repeatedly, but in vain, to the Civil Service Commission and had them advertise throughout the country for soil physicists in order that we might cooperate with the people regarding the deterioration of their soils. All the older sections of the United States have injured their soils by injudicious management. A knowledge of plants, their life history, the diseases to which they are subject, their relations to the soil, the climate, the food necessary so their best development, is so scarce among us that plant physiologists and pathologists can not be found by advertising for them.

Animal husbandry is very little understood, and in most of the educational institutions of the country sufficient instruction is not given to make it better understood, yet, from this source we make our most profitable sales to foreign countries. The Biological Survey and other divisions have also to train the men to do their work. When the Department requires the assistance of men educated along these lines it is necessary to educate them in its own scientific divisions, under the direction of its own scientists. When it has trained such men until they become expert and stand at the head of their specialties in the United States (and in many cases in the world), then wealthy institutions take them away by offering higher salaries, interfering with the work of the Department along the lines mentioned, which is so necessary to the producers of the United States.

To meet some of these difficulties and avoid in future their frequent recurrence, I have arranged with the Civil Service Commission to make a register of the graduates of the land-grant colleges of the United States (those endowed by Congress to educate the young farmers of the country). From this registration the scientific divisions of the Department select young men who will assist the division scientists in their work, and have opportunities for post-graduate study and for better preparing themselves along the lines of applied science, whereby the producer is helped by the scholar. We pay these young men no more than we pay a laborer, and much of the work they will perform in the divisions could be performed by skilled laborers.

Slight inquiry into education along the lines of agricultural science will show that there is no university in the land where the graduate of an agricultural college who has been studying along the lines indicated can take post-graduate work. The scientific divisions of the Department of Agriculture come nearer furnishing the necessary facilities than can be found elsewhere. If two or three young men come to each of our scientific divisions and study along the lines of the application of science to production in the field, the stable and the farm factory, the Department will in a few years have a force from which it can not only fill vacancies when wealthy institutions take away trained men, but be able to supply the agricultural colleges, experiment stations, and other scientific institutions in the land with men of superior scientific attainments in these branches.

By this new departure the Department is merely arranging to meet the imperative demands of the producers of the country for help to solve the problems that are beyond their education and their means. The Congress of the United States, in providing for the endowment of agricultural colleges and experiment stations, did more for the agriculture of the country than has been done by governmental agency for the people of any nation. Congress could not endow these institutions with teachers trained in the applied sciences relating to the farm, but Congress has built up the Department of Agriculture and encouraged the development of the foremost scientists known in their several specialties. The step we have taken toward bringing the brightest students of the agricultural colleges to prosecute their studies under the supervision of scientists in this Department is one step necessary to complete the educational system.

Something no doubt remains to be done at the other end of the educational line. The education of the young farmer in the district and high schools should be such as to help him toward the agricultural college. The other educational institutions of the country have done their work well, but so abundantly that the college graduate upon leaving college is not sure of employment that will give the salary of a brakeman on the railroad. Only a very few of those who upon leaving college must earn their livelihood through their literary education are sure of incomes equal to that of a locomotive engineer. The great unexplored field for the educator is along agricultural lines. Half of the people of the United States are interested in it. The prosperity of our country as a nation among nations depends upon it.

I hope to have the approval of Congress in this effort to provide for the higher education of the graduates of the agricultural colleges by appropriations sufficiently considerate to justify the very moderate expense that will be entailed.

BAROMETRIC CORRECTIONS AND REDUCTIONS.

On January 1, 1900, the Weather Bureau will adopt several modifications of previous usages, dictated by the needs of the service and looking to the simplification of records. A knowledge of these new rules will be useful to all who use our data, and therefore we reprint the following extracts from Instructions No. 139 of December 2, 1899:

After January 1, 1900, a specific elevation above sea level will be adopted for each station, and for purposes of record

and publication all barometric observations will be correlated to this "adopted or station elevation." In case, therefore, an office is moved to new quarters and the elevation of the barometer is thereby changed, a proper correction will be applied to the barometric readings in the new location that will reduce the observed reading to the pressure appropriate to the "station elevation," notwithstanding changes and removals.

The pressure thus ascertained will be designated "station pressure."

The "station elevation" for a station in operation January 1, 1900, will be its elevation above sea level on that date. For stations closed before 1900, or subsequently established, the elevation will be, in general, the elevation above sea level of the zero point of the barometer at the date of closing or opening the respective stations.

Reduction of current observations in accordance with the foregoing plan will, therefore, be required only when changes are made in the elevations of the barometers. In all such cases, the Instrument Division of the Central Office will furnish a new copy of the barometer correction card (Form No. 1059–Met'l), in which a "removal correction," based on the change made in the elevation of the barometers will be combined with the corrections for local gravity, scale errors, etc. The "sum of corrections" thus determined, together with the "correction for temperature," will be applied to all recorded readings of barometric pressure, and the result will be regarded as the pressure of the air appropriate to the station in question.

The barograph will be adjusted and corrected to correspond with the corrected air pressure thus obtained.

The following example will elucidate the complete correction of observed barometer readings:

Observed barometer reading (attached thermometer, 76.5°)		30.287
Correction for temperature	−0.131	
Sum of corrections, Form No. 1059–Met'l.	+0.032	
Total correction	−0.099	−0.099
Station pressure		30.188

The "total correction," as shown above, will be entered on the present edition of Form No. 1001–Met'l, in the column in which the "correction for temperature" has been recorded heretofore, and applied to the "observed" reading, deriving thereby the pressure of the air appropriate to the adopted elevation of the station, which pressure will be recorded in the adjoining column.

All pressure observations made at a station and reduced according to the foregoing plan will, therefore, be strictly comparable with each other, all being reduced to the adopted elevation. Furthermore, a change of elevation and removal of office will not, as heretofore, necessitate a new table of reductions to sea level; that is, all observations will be reduced to sea level, when required, by one and the same table of reduction; namely, that based on the adopted elevation of the station.

The following nomenclature, embracing barometric terms, will be used, as far as practicable, in the correspondence, records, and publications of the Weather Bureau:

Actual elevation.—The height of the zero points of the barometers of a station above sea level.

Station elevation.—The elevation above sea level adopted for a station as the basis to which all pressure observations at the station are correlated.

Observed reading.—The direct result of the reading of an instrument, uncorrected for any errors.

Actual pressure.—Meaning the actual pressure of the air at a barometer, as obtained from the observed reading after applying the necessary corrections for temperature, gravity, and instrumental errors.

Station pressure.—A pressure corresponding to an "adopted or station elevation" differing slightly from the actual elevation of the barometer. When the actual elevation is the same as the station elevation, the removal correction will be zero and the actual pressure and the station pressure are then numerically equal.

Reduced pressure.—The actual or station pressure reduced to sea level, or to some other specified plane.

Correction for scale errors, capillarity, etc.—A mean difference between the readings of a given instrument and those of the standard barometer duly corrected. This quantity embraces all outstanding errors in the total length and in the subdivision of the scale; errors in the adjustment of the sighting edge to the zero line of the vernier; errors of capillarity, imperfect vacuum, etc.

Correction for temperature.—The correction depending on the temperature of the mercury and the metallic scale.

Correction for local gravity:

(*a*) *Latitude term.*—The correction based on the variation of the force of gravity with latitude.

(*b*) *Altitude term.*—The correction based on the variation of gravity with altitude above sea level.

Removal correction.—The correction necessitated by the removal of an office, and based on the difference between the actual elevation of the barometer in the new location and the adopted elevation for the station in question.

Sum of corrections.—A term embracing all the corrections that are practically constant for a given instrument and in a given location, namely: the correction for scale error, capillarity, gravity, and the removal correction. This sum is given on the certificate of corrections (Form No. 1059–Met'l) furnished for each instrument.

Total correction.—The correction for temperature, plus the "sum of corrections" as defined above.

Reduction to sea level.—The quantity which must be added to the "actual" or "station" pressure, in order to obtain the "reduced" pressure.

Reduction for elevation.—A quantity which must be added to or subtracted from the pressure at a given elevation in order to deduce therefrom the pressure appropriate to some other specified elevation.

METEOROLOGY IN THE UNIVERSITIES.

Prof. James A. Lyon of the Southwestern Presbyterian University, Clarksville, Tenn., writes:

Our college has been enabled to take a much needed step forward in expanding somewhat our scientific department, allowing me to introduce a course in meteorology. I am using the text book of W. M. Davis, which I find an excellent one in many respects. I want to supplement the text book by as much practical work and instrumental illustration as possible.

The modern methods of teaching require that instruments be available and observations be taken in order to carry out the so-called "laboratory method" of instruction. Those who keep weather records are best prepared to profit by the work of the Weather Bureau. Those who deal in accurate measurements can best appreciate the spirit that animates all who are devoted to the progress of meteorology. Even if a school has not the funds to purchase a small outfit at the present time yet it is well to teach the subject as thoroughly as is practicable. Records of the sensible changes in temperature and dryness, the rainfall, winds, weather, and clouds, and the progress of vegetation, are still as valuable as they were long ago, when instruments were comparatively rare, and will always be of the greatest importance as a means of educating one to observe accurately and reason

correctly. The study of nature has both an intellectual and a scientific aspect. From the latter point of view one records new or special phenomena, and may hope to discover new laws of nature, but from an intellectual point of view the study becomes a means of increasing one's knowledge and disciplining one's reason and senses; from this point of view, every one, old and young, must derive benefit from the study.

BACK NUMBERS OF THE MONTHLY WEATHER REVIEW.

Mr. Barry C. Hawkins, Voluntary Observer, Horse Cove Station, N. C. (post office address, Highlands, Macon Co., N. C.) desires to exchange back numbers of the MONTHLY WEATHER REVIEW for the following publications:

Weather Bureau Bulletin No. 11, Parts 1 and 2.
Signal Service Notes No. 9. "Weather Proverbs."
Greely, "Report on the Climatology of the Arid Region."
Greely, Report on the Lady Franklin Bay Expetion.

METEOROLOGICAL OBSERVATIONS AT PUBLIC SCHOOLS.

The following is an excellent presentation of this subject by Mr. H. E. Wilkinson, Local Forecast Official and Section Director, Vicksburg, Miss., and is reprinted from the December report of the Mississippi Climate and Crop section. Ideas similar to those of Mr. Wilkinson have indeed been advocated by others in other places, but his presentation is quite well worth reading. The study of nature herself and familiarity with nature rather than with books is the leading idea of modern education, from the primary school up to the post graduate schools of the university.

In the autumn of 1881 the Editor's attention was drawn to the excellent "Nature Study" introduced into the Normal School at Washington, D. C., and thence into the lower grade public schools, by Miss Lucilla E. Smith, who subsequently removed to Brooklyn, N. Y., and introduced the same ideas into the schools of that city. The fundamental principles of nature study are now rapidly spreading throughout this country and must eventually prevail everywhere, for they are founded on correct principles and necessarily bring about successful results. A child is naturally a learner; he is an inquisitive student and experimentalist. At first he learns by bumps and bruises and through pains and troubles; frequently he actually makes experiments and observes closely and reasons and argues to himself. It is always easier for him to learn by personal experience than by reading books or listening to others tell about things as seen by them. Give him stones, woods, flowers, birds, insects, animals, clay and sand, tools and materials to handle and work with. He learns best about men and things and principles by coming into daily personal contact with them. In order to stimulate him to accuracy, he is encouraged to measure and record carefully. The weather lends itself to this method of training quite as easily as any other subject. He may learn a little meteorology, but more important is it that he learn accuracy of observation and correct logical reasoning. The set of forms for a daily record of the weather introduced into the Washington Normal School in 1881, by the present writer, was simply a suggestive leader for the children and their teachers. Both these forms and the work done were subsequently put on exhibition in the Educational Department of the Exposition at New Orleans, La., in 1884–5.

In an address before a teachers institute in California several years ago the writer urged that every school house be provided with instruments and weather observations be taken. This opinion has been strengthened by the publication recently of a circular by the Department of Agriculture entitled "A German Common School with a Garden," from which the following extracts are taken:

"In most instances this garden is used solely as a source of income and pleasure to the teacher. Occasionally, however, some specially active and wide-awake teacher sees in the garden a means of instruction. Here plants can be watched in their development from seed to flower and fruitage; the curled leaves on a choice plant may show where some insect has made its home; a heavily-laden apple tree may suggest the value of pruning; a few pansies or a rose bush rightly placed may awaken ideas of beauty. * * * Pupils working among these flowers, pruning trees, or gathering berries from vines planted and tilled by themselves, may acquire an interest in nature and husbandry which will remain with them throughout their after life."

It is for the same good of the scholar that weather observations should be taken at every school house. A wide-awake teacher with a maximum and minimum thermometer and a rain gage can soon develop such an interest in a practical way that the lessons in physical geography, instead of being dull, will become intensely interesting and the scholars will have demonstrated to them in practice what the geographies teach theoretically.

The Weather Bureau has been doing a work of education since its organization, but notwithstanding the hundreds of thousands of weather maps and other publications that are disseminated annually comparatively few people receive them. It has undertaken to cover the country with its regular stations of observation, supplemented by the cooperating voluntary observer. This in whole amounts to about 3,035 points of observation and covers not only the United States proper but points in the West Indies and bordering on the Caribbean Sea and Alaska. Deducting the West Indian service and Alaska, we have one station for about every 1,175 square miles.

Of course the larger number of observations are made in the more thickly populated parts of the country. California, as an instance, with its 158,360 square miles has 318 observing stations, or one for about every 500 square miles, while Texas with 265,780 square miles has but one station for every 2,550 square miles. It is impracticable for the general Government to so cover the country as to bring out local climatology, now much needed. The study of climatology was never so closely followed as now. Meteorology has never been connected with so many subjects as at present. The weather influences every process of life, every plant, and every animal. It is the commonest topic of conversation, the subject considered in connection with more plans than any one thing, and yet there is but one observer for every 1,175 square miles, approximately, and very few people apply the facts given each day in any practical way. It is so commonplace, in fact, as to be generally neglected.

With a class of people in our schools interested in the science of meteorology an intelligent knowledge of the movement of storms and climotology will soon attain and the great service of the Weather Bureau made of increasing value. Every section has its peculiarities of temperature and precipitation, but because of the lack of observation nothing is known of these peculiarities. The General Government makes exhaustive experiments on the growth of plants. We are told just what kind of a soil or climate is best adopted to the successful cultivation of nearly every useful plant, and the people should avail themselves of this knowledge by more completely studying the local conditions as related to temperature, precipitation, humidity, etc., and by applying one to the other.

A plan of work by which this idea might be carried into effect would at best be tentative. It must be elastic enough to admit of its adoption under many and varying conditions and yet reach the same general result. The most feasible plan is thought to be that of having the teacher responsible in person for the work, but through her the scholars perform the actual work, her participation being more in the nature of an instructor and not as an observer. There is frequently some scholar in a school who is fond of investigation, or who takes more than a passing interest in the weather. Such would make a good observer. The scholar should be taught to apply personal observation and connect present conditions with those following, as well as those past, and in this way note the rotation of storms. The blackboard in the school room affords a simple means of interesting the entire school by placing each day's observation thereon. The permanent records should be maintained in a book kept for that purpose. As the record grows daily it will become more interesting. The problem of small attendance at school on certain days, or the mental depression and consequent lack of satisfactory progress in studies and many other equally interesting problems will find solution.

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Chief of Division of Meteorological Records.

In the majority of districts moderate winter weather prevailed during the greater part of the month. From about the 20th to the end of the month the weather was uniformly cold but without severe storms or other marked disturbances. The precipitation was above normal in the Gulf States and the great interior valleys. It was markedly deficient only in New England and the Middle and South Atlantic States. Three lows moved from Texas northeastward to the Gulf of St. Lawrence during the month, all of which were attended by copious rains.

On the Pacific coast there was an abundance of rain from central California northward to British Columbia. Clear, dry weather prevailed quite generally from the 19th until the end of the month. There were no destructive storms.

The snowfall was rather light and disappeared rapidly. At the end of the month there was not much snow on the ground.

PRESSURE.

The monthly mean isobars, as drawn on Chart IV, differ but slightly in their configuration from those of a normal month. The winter high of the western Plateau extended somewhat further southeast than is the case in a normal month, and the increase in pressure as compared with the preceding month was relatively greater over the Rocky Mountain and Plateau region than over the South Atlantic States. There was an increase from November to December of more than 0.20 inch in monthly mean pressure throughout the northern and middle plateaus, and also in Assiniboia and Alberta.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

Temperature was from 2° to 3° above normal from New England westward through the Lake region, and along the northern boundary to the Pacific coast and also over southern California, Arizona, and New Mexico. It was below normal by amounts ranging from less than a degree, on the average, on the south Atlantic coast to about 5° in Missouri and eastern Kansas. On the whole the month was not so severe as the corresponding month a year ago. In New England and the Middle States the weather was mild and pleasant up to Christmas. There was not as much snow in southern New England as in the interior of the Gulf States. The snow in the Gulf States, however, did not last long, although several moderate cold waves passed over the Gulf and South Atlantic States, during the month, a minimum temperature of 30° being recorded at Jacksonville.

There were comparatively few days with zero temperature in the extreme northwest, and no very severe and widespread cold waves in any part of the country.

In Canada.—Prof. R. F. Stupart says:

Temperature was above average throughout the Dominion, except in a few small sections, where it was just about the average, or slightly below. These sections were a portion of Alberta, the extreme southern part of Assiniboia, the extreme southwestern part of Ontario, and in the neighborhood of White River, in the Lake Superior district. From the Georgian Bay region to our Atlantic coast the average was considerably exceeded. Parry Sound was 3° above; Kingston, 4° above; Ottawa and Montreal, 5° above; Quebec, 7° above; Charlottetown, 6° above, and Halifax 4° above.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	34.2	+ 2.6	+ 4.8	+ 0.4
Middle Atlantic	12	37.0	+ 0.8	+ 3.1	+ 0.3
South Atlantic	10	47.2	− 1.5	+ 2.7	+ 0.2
Florida Peninsula	7	61.2	− 0.5	+ 4.0	+ 0.3
East Gulf	7	50.4	− 1.8	− 0.5	0.0
West Gulf	7	49.3	− 2.1	+ 2.7	+ 0.2
Ohio Valley and Tennessee	12	35.4	− 2.9	+ 5.9	+ 0.5
Lower Lake	8	30.3	− 0.2	+ 9.7	+ 0.8
Upper Lake	9	24.4	− 0.1	+ 6.9	+ 0.6
North Dakota	7	13.9	+ 1.0	− 4.9	− 0.4
Upper Mississippi	11	26.7	− 1.7	+ 6.4	+ 0.5
Missouri Valley	10	25.7	− 3.1	+ 2.3	+ 0.2
Northern Slope	7	24.0	− 0.9	−17.4	− 1.4
Middle Slope	6	32.3	− 2.6	+ 1.0	+ 0.1
Southern Slope	6	38.8	− 2.8	− 2.8	− 0.2
Southern Plateau	13	41.9	+ 1.2	− 2.8	− 0.2
Middle Plateau	9	26.4	− 2.4	−12.2	− 1.0
Northern Plateau	10	29.4	− 0.2	−10.5	− 0.9
North Pacific	9	43.4	+ 1.5	− 5.1	− 0.4
Middle Pacific	5	47.6	− 0.9	− 3.9	− 0.3
South Pacific	4	53.6	+ 0.9	− 3.5	− 0.3

PRECIPITATION.

A little more than half the normal amount of rain and snow fell in the New England, Middle, and South Atlantic States, and there was also a deficit in the Plateau region and the middle and south Pacific coast regions. The amount and distribution of precipitation east of the Rocky Mountains were largely influenced by the fact that three areas of low pressure moved from Texas northeastward in somewhat different paths, each, however, contributing a generous share of the total precipitation of the month. The rather unusual phenomenon of precipitation occurring from the Atlantic to the Pacific within a period of twelve consecutive hours was noted on the morning weather map of December 12. An area of low pressure had advanced from the north Pacific to the Dakotas where it was central on the morning of the 12th. Rain or snow was falling, or had fallen, along the northern boundary from the Pacific to the Dakotas and Minnesota. A second low of considerable depth, whose influence extended to the Atlantic Ocean, occupied the Lake region. Precipitation was occurring on the morning of the above named date, or had occurred within the previous twelve hours at 86 of the 117 stations, whose observations were telegraphed to the Central Office in Washington, D. C.

In Canada.—Professor Stupart says:

The precipitation was below average over British Columbia, Manitoba, and the southern portions of the Northwest Territories, below average over the Peninsula of Ontario, and in parts of Nova Scotia and Prince Edward Island, and elsewhere above the average. At Parry Sound the average was exceeded by 3.8 inches, at Kingston by 2.5 inches, at Montreal by 1.3 inches, and at Sydney by 3.0 inches. During the first three weeks of the month the precipitation was very largely rain, but during the last week it was in Ontario, Quebec, and the Maritime Provinces nearly altogether snow. In British Columbia there was no snow on the ground at the end of the month; the Northwest Territories and Manitoba had only a light covering, or in some localities none. In Ontario it varied from a trace at southwestern stations to from 10 to 20 inches in northern localities. In Quebec it varied from 2 to 10 inches, and in the Maritime Provinces from 2 to 13 inches.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	10	1.87	51	−1.8	− 7.3
Middle Atlantic	12	1.55	48	−1.7	− 5.6
South Atlantic	10	2.14	60	−1.4	− 7.2
Florida Peninsula	7	2.23	105	+0.1	− 1.9
East Gulf	7	5.02	116	+0.7	−11.0
West Gulf	7	3.78	115	+0.5	− 8.7
Ohio Valley and Tennessee	12	3.45	97	−0.1	− 6.2
Lower Lake	8	3.55	125	+0.7	− 6.9
Upper Lake	9	2.29	105	+0.1	− 4.3
North Dakota	7	0.43	81	−0.1	− 2.4
Upper Mississippi Valley	11	1.97	95	−0.1	− 0.8
Missouri Valley	10	1.20	100	0.0	− 5.6
Northern Slope	7	0.65	144	+0.2	− 0.2
Middle Slope	6	1.21	133	+0.3	+ 4.2
Southern Slope	6	1.95	134	+0.5	+ 7.3
Southern Plateau	13	0.44	33	−0.9	− 3.4
Middle Plateau	9	1.06	73	−0.4	+ 1.4
Northern Plateau	10	1.40	70	−0.6	0.0
North Pacific	9	7.25	100	0.0	+11.1
Middle Pacific	5	4.02	72	−1.6	+ 2.0
South Pacific	4	1.79	60	−1.2	− 1.7

SNOWFALL.

The depth of snowfall during the month is graphically shown on Chart VIII, and the numerical values are given in Table II.

The total snowfall for the month was somewhat less than during the corresponding month a year ago. It was rather widely distributed, however, and disappeared rapidly on account of the prevailing mild weather east of the Rocky Mountains during the first half of the month. At the close of the month a moderate cold wave accompanied by a snowstorm passed over the interior of the Gulf States. The snow covering was not more than two or three inches on the average, yet it exceeded in amount the total fall in the South Atlantic States, the eastern portion of the Middle States, and southern New England. The fall in the Lake region was moderately heavy, and this was particularly so of the Parry Sound region, as was the case a year ago. No very great depths were reported from mountain stations in Colorado, Wyoming, Montana, and Idaho.

The depth of snow on the ground at the close of the month is graphically shown on Chart IX.

The officials in charge of the Climate and Crop sections in Colorado and Wyoming, concerning the snowfall in their respective States, report as follows:

Snowfall in the mountains of Colorado.—The weather conditions during October, November, and December were not favorable to the accumulation of a large stock of snow. It is true that a heavy fall was general during the second decade of October, and another about the middle of December, but the remainder of the period was characterized by an absence of local storms of consequence, and for the mountain districts as a whole the amount is below the average. Windy weather has been the exception, and, in consequence, the snow is loosely packed, and stupendous drifts, which form the basis of the flow during the summer season, are notably few. The ground was well supplied with moisture and frozen to a considerable depth before the October storm; hence it is expected that the run-off, when melting begins in the spring, will be relatively great as well as rapid.

The distribution has been very uneven over the watershed of the Arkansas. As compared with last year and the average, the fall has been very light over the northern drainage area, while over that of its southern tributaries it has been considerably above the average, and many correspondents report that the stock of snow now on the ranges is much in excess of the total during last winter.

The fall has been very close to the average over the upper drainage area of the South Platte and tributaries, but generally much less than last year.

No such scarcity of snow as characterized last winter over the Rio Grande watershed is reported this season. The average amount has fallen in the mountains of Mineral and Hinsdale counties, and on the watersheds of the tributaries rising in Conejos and Costillo counties.

Less than the normal snowfall has occurred in nearly all parts of the area drained by the Grand and Gunnison. Compared with the corresponding months of last year, the fall has been exceeding light.

Snowfall in Wyoming.—The snowfall throughout the State for December was usually below the average, but was fairly well distributed. At the close of the month many stations reported little or no snow on the ground. Over Laramie County only traces of snow remained, increasing northward to Sheridan County, 5 inches being reported on ground at Buffalo, and 6.5 inches at Sheridan. Over Big Horn County the amount on ground varied from little or no snow to 8 inches, the greatest depth being reported from the lower portion of the Basin. Little or no snow was on the ground over the western portion of the county. The greatest depths of snow on ground were reported from Uinta County, where from 2 to 8 inches remained over the plains and valleys.

Reports from the mountain districts show from 4 to 40 inches of snow at present, and reporters generally concede this to be less than the usual amount at this time of the year. However, snows of the later winter may augment the amount very much, and provide a bountiful supply for irrigation purposes the coming summer.

The following table gives the amount of snow reported from the eastern slope of the Big Horn Mountains and from the basins of the Platte and Laramie rivers:

Eastern slope of Big Horn Range.	Snow on ground in vicinity of place.	Average depth on adjacent hills or mountains.	Laramie and Platte basins.	Snow on ground in vicinity of place.	Average depth on adjacent hills or mountains.
Parkman	6	15	Clarkson	0	3
Dayton	10	36	Springhill	0	6
Mayoworth	1	14	Toltec	1	12
Griggs	3	12	Elk Mountain	0	60
Kaycee	3	7	Bennett	5	13
Ono	4		French	8	15
			Mandel	2	8

Mr. Foster in his report from the Snowy Range reports 3 inches at 8,700 feet, 28 at 9,000, 36 at 10,000, and 39 at 11,000. This is more than was reported from the same locality one year ago. He says: "I find the snow drifted but little at the greater elevations as compared with other winters. Scarcely any frost in the ground. Above 10,000 feet many of the drifts of 1898-99 are still in evidence, and will add to the water supply of the coming summer. The water in the streams is nearly double the usual stage at this season. The snow of the second week in October is well packed, as well as that which has fallen in the later storms."

HAIL.

The following are the dates on which hail fell in the respective States:

Arizona, 18. Arkansas, 18. California, 15, 16. Oregon, 4, 11, 12, 14, 20. Texas, 10. Washington, 7, 8, 9.

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 4, 5, 6, 7, 30, 31. Arkansas, 13, 14, 30. Colorado, 4, 8, 9, 29, 30. Connecticut, 17, 19, 24. Florida, 31. Georgia, 27, 31. Idaho, 30. Illinois, 14, 23. Indiana, 7, 12, 14, 23. Indian Territory, 11, 13, 21. Iowa, 2, 3, 9, 11, 18. Kansas, 13, 17, 18, 22, 23, 26. Kentucky, 13, 14, 23. Louisiana, 30, 31. Maine, 4, 15, 22, 24. Maryland, 24. Massachusetts, 15, 24. Michigan, 1, 6, 9, 12. Mississippi, 30, 31. Missouri, 2, 3, 8, 11, 12, 13, 14, 22, 23, 26, 27. Nebraska, 2, 3, 12, 15, 29. Nevada, 8, 11, 12. New Hampshire, 11, 15, 24, 25. New Jersey, 10. New Mexico, 10, 18. New York, 3, 4, 10, 13, 14, 15, 17, 19, 21, 22, 23, 24. North Carolina, 3, 23, 24, 25, 27, 28. Ohio, 11, 14, 23. Oklahoma, 13, 21, 31. Oregon, 7. Pennsylvania, 14, 24. South Carolina, 24, 28, 31. Tennessee, 14, 24, 26, 27. Texas, 12, 14, 19, 20, 27, 29, 30. Utah, 12, 14, 15, 16, 17, 18. Vermont, 3, 4, 15, 24, 25. Virginia, 19, 23, 24. Washington, 3, 7, 8, 10, 12, 19, 21. West Virginia, 23. Wisconsin, 4, 11.

WEATHER IN THE WEST INDIES.

The distribution of pressure, temperature, and the direction of the resultant winds in the West Indies are shown on Chart X. The numerical values of pressure, temperature, etc., for West Indian stations will be found in Tables I, II, III, IV, V, VI, VIII, IX, and X.

The maximum wind velocity for West Indian stations was 38 miles per hour from the northeast at Havana on the 7th; generally, however, light winds prevailed. The rainfall was deficient at both Havana, Cuba, and San Juan, Puerto Rico, the only stations having normal values. It was also light at other places, particularly at Cienfuegos, Cuba.

HUMIDITY.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	75	0	Missouri Valley	75	0
Middle Atlantic	72	— 2	Northern Slope	75	+ 8
South Atlantic	72	— 7	Middle Slope	72	+ 7
Florida Peninsula	79	— 3	Southern Slope	73	+ 6
East Gulf	73	— 5	Southern Plateau	41	— 7
West Gulf	73	0	Middle Plateau	70	+ 3
Ohio Valley and Tennessee	73	— 2	Northern Plateau	81	0
Lower Lake	76	— 2	North Pacific Coast	86	— 2
Upper Lake	82	+ 1	Middle Pacific Coast	84	0
North Dakota	81	+ 2	South Pacific Coast	71	3
Upper Mississippi	77	+ 1			

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.5	−0.3	Missouri Valley	5.6	+0.5
Middle Atlantic	4.9	−0.5	Northern Slope	5.8	+1.2
South Atlantic	4.5	−0.2	Middle Slope	4.9	+0.9
Florida Peninsula	5.3	+0.7	Southern Slope	5.2	+0.8
East Gulf	5.7	+0.5	Southern Plateau	3.4	+0.4
West Gulf	5.2	−0.1	Middle Plateau	5.5	+0.4
Ohio Valley and Tennessee	5.8	−0.3	Northern Plateau	7.1	0 0
Lower Lake	7.6	0.0	North Pacific Coast	7.9	+0.6
Upper Lake	6.7	−0.4	Middle Pacific Coast	5.6	+0.2
North Dakota	4 8	−0.4	South Pacific Coast	4.6	+0.2
Upper Mississippi	5.2	−0.5			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Block Island, R. I	24	51	e.	Mount Tamalpais, Cal.	6	76	n.
Buffalo, N. Y	2	50	sw.	Do.	15	53	sw.
Do.	5	52	sw.	Do.	20	50	n.
Do.	7	53	sw.	Do.	21	58	nw.
Do.	12	64	w.	Do.	22	70	n.
Do.	13	50	sw.	Do.	24	61	ne.
Carson City, Nev	11	60	sw.	Do.	30	64	sw.
Chicago, Ill	5	50	w.	New York, N. Y	4	50	n.
Do.	11	50	sw.	Do.	6	54	nw.
Do.	12	56	sw.	Do.	12	55	s.
Cleveland, Ohio	12	50	s.	Do.	13	50	ne.
Do	24	52	w.	Do.	24	63	e.
Detroit, Mich	12	50	sw.	Do.	30	50	nw.
Fort Canby, Wash	7	76	se.	Northfield, Vt	12	50	s.
Grand Haven, Mich	12	52	sw.	Winnemucca, Nev.	15	50	se.
Mount Tamalpais, Cal.	5	68	nw.				

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table VII, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 167 thunderstorms were received during the current month as against 148 in 1898 and 661 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 10th, 41; 11th, 30; 18th, 27.

Reports were most numerous from: Louisiana, 35; Arkansas, 29; Mississippi, 17.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 12th to 20th.

Reports were most numerous from Montana and North Dakota, 5; Minnesota, 3.

In Canada.—Auroras were reported as follows: Minnedosa, 8th, 9th, 28th, 29th, 30th. Battleford, 28th, 29th, 31st.

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Chief of Division of Meteorological Records.

For description of tables and charts see page 424 of REVIEW for September, 1899.

TABLE I.—*Climatological data for Weather Bureau Stations, December, 1899.*

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.									Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.			Wind.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Mean actual, 8 a. m. and 8 p. m. + 2.	Mean reduced.	Departure from normal.	Mean max. and min. + 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.				Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				
New England.							34.2	+ 2.6										73	1.87	— 1.8								5.5	
Eastport	76	69	74	29.95	30.04	+ .07	30.2	+ 4.7	53	19	36	4	31	24	25	28	24	78	3.42	— 0.6	17	9,726	w.	46	se.	15	7	9	15	6.7	9.2
Portland, Me	103	81	89	29.91	30.02	.00	32.1	+ 4.7	54	13	38	5	31	26	22	28	23	73	2.84	0.7	9	5,944	w.	39	s.	12	7	10	14	6.2	3.8
Northfield	872	15	68	29.05	30.05	.00	23.9	+ 2.5	57	12	32	— 8	31	16	37	21	18	80	2.31	— 0.8	13	6,948	s.	50	s.	12	0	16	15	7.7	13.7
Boston	125	115	181	29.92	30.06	+ .02	36.2	+ 5.1	66	12	43	5	31	29	28	32	26	69	1.52	— 2.0	6	8,422	w.	42	s.	12	14	7	10	5.0	T.
Nantucket	14	43	54	30.06	30.07	+ .02	37.4	+ 1.0	55	12	43	8	31	32	24	34	30	74	1.08	— 3.2	15	8,962	nw.	41	se.	24	8	8	15	6.1	1.7
Woods Hole	22	11	57	30.05	30.07	+ .03	37.4	+ 2.3	58	12	42	10	31	32	23	34	30	78	1.52	— 2.0	9	12,326	nw.	48	s.	12	14	7	10	4.6	1.0
Vineyard Haven	.....	20	55	.. ...	.....	.....	38.3	+ 0.7	61	12	45	10	31	32	26	.....	...	...	1.57	— 2.2	12	7,284	w.	30	w.	4	11	16	4	4.7	2.1
Block Island	37	11	70	30.04	30.07	+ .02	37.8	+ 1.6	60	12	43	11	31	32	26	35	29	70	1.46	— 2.2	10	13,693	w.	51	e.	24	12	9	10	4.7	0.9
Narragansett	.....	10	....	.....	.....	.....	34.9	+ 2.1	58	12	43	4	31	27	31	.	...	...	1.40	— 2.3	6	.....	nw.	....	.....	...	19	5	7	....	T.
New Haven	107	117	140	29.96	30.08	.00	34.0	+ 1.8	59	12	41	6	31	27	23	30	26	76	1.56	— 1.8	6	6,753	nw.	44	s.	12	16	10	5	4.0	T.
Mid. Atlan. States.							37.0	+ 0.8										72	1.55	— 1.7								4.9	
Albany	97	84	113	29.93	30.07	.00	32.3	+ 3.7	61	12	39	2	30	26	24	29	25	78	1.55	— 1.2	9	5,913	s.	46	e.	24	6	9	16	7.1	2.2
Binghamton	875	79	90	.....	.....	.....	30.6	+ 2.1	61	12	38	— 1	30	23	27	....	....	....	2.02	— 0.8	11	6,149	w.	36	s.	12	3	8	20	7.4	1.0
New York	314	108	346	29.75	30.10	+ .01	36.4	+ 2.0	60	11	43	8	30	30	25	33	29	75	1.37	— 1.9	8	12,846	nw.	64	nw.	15	10	13	8	4.9	0.2
Harrisburg	377	94	104	.....	.....	.....	34.3	— 0.1	62	12	40	7	31	28	21	....	...	...	1.83	— 1.2	9	6,693	w.	36	nw.	15	8	13	10	5.7	0.4
Philadelphia	117	168	184	29.99	30.12	.00	37.5	+ 2.0	65	11	44	8	31	31	22	33	27	69	1.41	— 1.3	7	7,583	nw.	38	s.	12	14	10	7	4.4	0.5
Atlantic City	52	68	76	30.05	30.11	+ .02	36.9	+ 0.5	58	13	44	8	31	30	27	34	30	78	1.35	— 2.5	6	8,606	nw.	43	se.	24	11	17	3	4.2	0.3
Cape May	17	47	51	30.12	30.14	.....	38.6	+ 0.7	58	13	45	12	31	33	23	36	....	....	1.61	— 2.7	6	7,424	nw.	40	se.	24	10	13	8	4.6	T.
Baltimore	123	68	82	29.97	30.11	— .01	37.4	+ 0.1	67	12	45	9	31	30	26	32	26	67	1.40	— 1.8	7	4,036	w.	24	w.	24	15	9	7	4.5	0.7
Washington	112	59	76	30.01	30.13	— .01	36.2	0.0	67	12	46	3	31	26	33	31	25	69	1.68	— 1.3	9	5,353	nw.	36	nw.	15	21	5	5	3.4	1.8
Cape Henry	.....	5	34	.....	.....	.....	43.4	— 0.5	69	19	51	12	31	36	24	....	....	...	1.36	— 2.5	7	9,874	sw.	46	n.	19	10	17	4	5.1	0.2
Lynchburg	685	83	88	29.37	30.14	.00	37.9	— 1.4	65	11	48	7	31	28	35	32	26	68	1.74	— 1.3	5	3,369	nw.	28	se.	11	17	6	8	4.2	0.7
Norfolk	92	102	111	30.05	30.15	+ .03	42.9	+ 0.1	68	11	51	11	31	35	26	38	34	76	1.24	— 2.4	7	6,866	n.	36	s.	12	14	13	4	4.1	0.3
Richmond	144	98	105	.....	.....	.....	40.2	.....	68	11	49	4	31	31	27	....	....	...	2.33	.....	9	4,714	n.	30	n.	19	16	10	5	3.8	2.1
S. Atlantic States.							47.2	— 1.5										72	2.14	— 1.4								4.5	
Charlotte	773	68	76	29.30	30.15	+ .01	41.2	— 2.4	66	11	50	12	30	32	29	35	27	63	2.38	— 1.7	10	5,439	ne.	36	se.	11	16	2	13	4.7	T.
Hatteras	11	17	36	30.12	30.13	+ .02	48.4	+ 0.2	70	12	53	19	30	43	25	45	41	78	3.47	— 2.0	9	10,535	n.	44	n	19	17	10	4	3.7	T.
Kittyhawk	9	12	30	.....	.....	.....	46.0	— 0.2	68	14	52	12	31	40	22	....	....	...	2.47	— 1.7	4	10,261	.....	.....	.....	...	20	8	3	3.0	
Raleigh	375	93	101	29.75	30.16	— .01	41.8	— 2.1	69	11	51	9	31	32	29	35	29	67	2.02	— 0.7	9	4,724	n.	26	sw.	12	18	6	7	3.7	0.1
Wilmington	78	82	90	30.07	30.16	+ .03	46.5	— 1.8	72	19	56	16	30	37	28	40	36	74	1.41	— 1.6	7	5,980	w.	32	sw.	12	15	12	4	3.5	T.
Charleston	48	14	92	30.12	30.17	+ .04	51.3	— 0.2	73	19	59	24	30	43	25	44	39	70	0.85	— 2.4	8	7,971	n.	31	ne.	20	9	14	8	5.2	0.5
Columbia	.....	5	....	.....	.....	.....	45.2	— 3.3	73	19	56	17	30	34	41	....	....	...	3.01	+ 0.1	9	.....	n.	....	.....	...	10	14	7	5.1	0.4
Augusta	180	89	103	29.96	30.15	+ .02	45.4	— 2.3	71	19	55	21	30	36	33	39	35	72	1.80	— 1.6	10	5,140	w.	30	w.	25	14	9	8	4.5	1.4
Savannah	65	79	89	30.08	30.15	.00	50.9	— 1.5	77	19	60	27	30	42	28	44	38	70	1.62	— 1.6	7	6,033	n.	30	sw.	12	10	11	10	5.1	T.
Jacksonville	43	69	84	30.09	30.14	+ .02	54.9	— 1.1	76	14	63	30	30	47	26	49	46	80	2.35	— 0.5	11	5,900	ne.	35	w.	25	8	11	12	6.2	
Florida Peninsula.							66.4	+ 0.2										73	2.23	0.0								5.3	
Jupiter	28	13	30	30.05	30.08	— .04	67.0	+ 0.3	78	12	73	40	30	61	24	61	59	79	2.97	+ 0.3	13	8,472	e.	30	se.	11	7	20	4	5.2	
Key West	22	43	50	30.06	30.08	+ .01	71.0	+ 1.0	80	12	75	55	30	67	15	65	63	78	1.53	— 0.1	6	9,615	ne.	33	nw.	24	9	19	3	4.5	
Tampa	39	60	67	30.06	30.10	+ .02	61.1	— 0.8	80	11	70	34	30	52	25	55	52	80	2.18	0.2	9	5,168	ne.	27	se.	11	5	14	12	6.1	
East Gulf States.							55.4	— 1.3										73	6.22	+ 0.7								5.7	
Atlanta	1,174	139	156	28.89	30.17	.00	42.0	— 3.3	65	14	50	16	30	34	24	36	30	68	4.15	0.0	10	9,281	nw.	36	nw.	3	11	7	13	5.5	T.
Macon	370	93	99	.....	.....	.....	45.4	.....	70	1	55	22	30	36	34	....	....	...	3.45	. .....	10	5,273	nw.	30	se.	11	5	15	11	5.9	4.0
Pensacola	56	78	90	.....	.....	.....	53.2	— 1.3	71	11	61	30	29	46	23	....	...	...	6.05	+ 2.2	12	8,081	ne.	42	se.	11	13	4	14	5.5	
Mobile	57	88	96	30.08	30.14	+ .01	51.8	— 0.6	74	19	60	30	16	43	27	46	42	76	4.27	— 0.2	13	5,980	n.	29	sw	11	14	3	14	5.7	T.
Montgomery	221	100	112	29.91	30.15	.00	47.4	— 2.2	72	14	56	26	31	38	33	42	37	72	4.09	— 0.6	11	4,963	e.	27	nw.	3	11	5	15	5.5	3.5
Meridian	375	84	96	.....	.....	.....	45.6	— 4.9	72	14	55	22	6	36	38	....	....	...	6.51	+ 1.6	13	5,054	ne.	28	w.	4	11	5	15	6.0	2.0
Vicksburg	247	65	73	29.84	30.12	— .03	48.6	— 2.0	73	9	57	26	16	40	29	43	38	70	8.85	+ 3.9	13	6,248	se.	28	w.	11	11	9	11	5.5	1.2
New Orleans	54	112	120	30.07	30.13	+ .03	54.6	— 0.9	78	9	62	32	16	47	28	49	45	78	2.79	— 1.6	13	6,986	n.	36	w.	3	6	12	13	6.2	
Port Eads	.....	27	....	.....	.....	.....	60.4	+ 0.9	77	10	68	41	25	53	24	....	....	...	3.49	0.0	10	.....	e.	....	.....	...	10	7	14	....	
West Gulf States.							49.3	— 2.1										73	3.78	+ 0.5								5.2	
Shreveport	249	77	84	29.87	30.14	+ .01	48.8	— 0.7	72	9	58	25	16	39	33	42	35	65	3.52	— 1.2	13	5,793	se.	26	nw.	3	12	8	11	5.2	
Fort Smith	457	74	82	29.64	30.15	+ .02	40.4	— 2.4	71	2	48	19	15	32	35	35	29	70	3.65	+ 0.5	9	6,008	e.	31	sw.	3	11	7	13	5.8	1.5
Little Rock	357	93	100	29.77	30.17	+ .03	41.0	— 4.0	65	9	49	19	16	33	29	36	32	72	4.64	+ 0.3	8	6,116	ne.	34	nw.	1	11	9	11	5.7	3.2
Corpus Christi	20	42	50	30.09	30.11	+ .01	56.4	— 2.9	74	*	63	36	15	50	28	52	49	80	1.87	+ 0.6	7	7,791	n.	33	n.	3	11	8	12	5.2	
Fort Worth	670	106	114	.....	.....	.....	46.2	. .....	78	18	56	25	14	37	39	....	....	...	1.98	.....	7	8,018	nw.	30	s.	18	d14	d4	d9	d5.0	
Galveston	54	84	88	30.04	30.09	— .01	55.8	— 1.3	70	10	61	38	29	50	22	52	48	80	4.87	+ 0.9	15	8,234	e.	33	w.	11	13	4	14	5.6	
Palestine	510	54	61	29.59	30.15	+ .02	49.2	— 2.2	73	13	58	26	15	40	34	43	38	71	4.51	+ 0.7	11	5,574	ne.	26	sw.	12	14	4	13	5.3	
San Antonio	704	95	104	29.36	30.12	+ .01	53.6	— 1.3	76	13	64	30	15	44	33	46	41	71	3.39	+ 1.5	7	6,675	n.	45	n.	3	16	8	7	4.1	
Ohio Val. & Tenn.							38.4	— 2.9										73	3.45	— 0.1								5.8	
Chattanooga	762	106	112	29.35	30.20	+ .04	40.4	— 3.2	63	11	48	14	30	32	29	35	29	70	6.11	+ 1.8	13	6,038	nw.	35	w.	14	12	10	9	5.3	0.1
Knoxville	1,004	10	88	29.08	30.19	+ .01	37.8	— 2.1	67	11	46	9	31	30	30	33	28	74	2.70	— 1.4	11	6,008	sw.	47	sw.	11	12	5	14	5.8	0.5
Memphis	399	140	154	29.73	30.18	+ .03	42.0	— 1.6	64	8	49	20	30	34	24	35	28	64	4.05	— 0.1	10	8,697	n.	39	sw.	11	7	11	13	6.3	
Nashville	545	128	134	29.58	30.18	+ .04	38.0	— 3.7	64	11	46	12	31	30	29	34	29	74	4.64	+ 0.9	11	5,845	nw.	40	se.	11	11	6	14	5.5	1.0
Lexington	990	75	102	.....	.....	.....	33.4	— 4.7	62	11	41	— 1	31	26	25	....	....	...	2.92	— 0.5	12	9,097	w.	46	sw.	12	9	7	15	6.2	4.5
Louisville	525	114	136	29.56	30.16	+ .01	35.2	— 3.2	64	11	43	5	30	28	26	31	27	76	4.07	+ 0.2	12	7,206	sw.	44	sw.	12	11	8	12	5.5	2.3
Evansville	434	72	82	.....	.....	.....	34.9	.....	62	11	42	6	30	28	24	....	....	...	3.63	.....	11	6,443	nw.	37	sw.	11	13	6	12	4.8	0.6
Indianapolis	823	154	164	29.20	30.12	.00	29.8	— 3.3	59	11	37	0	30	23	24	26	21	70	2.77	— 0.4	8	9,467	nw.	46	sw.	12	8	7	16	6.2	6.9
Cincinnati	628	152	157	29.44	30.14	.00	33.2	— 3.4	61	11	41	2	31	26	25	30	25	72	2.93	— 0.2	10	6,988	sw.	37	sw.	12	13	5	13	5.2	2.2
Columbus	834	87	100	29.19	30.11	— .01	31.1	— 2.2	63	11	38	1	31	24	24	28	24	79	2.98	+ 0.1	12	6,793	sw.	48	sw.	12	7	9	15	6.3	2.1
Pittsburg	842	116	123	29.15	30.09	— .03	33.8	— 1.2	65	12	41	5	31	27	27	30	26	76	2.24	— 0.6	12	5,434	nw.	26	se.	11	7	10	14	6.3	1.6
Parkersburg	638	77	84	29.44	30.16	— .01	34.3	— 2.8	68	11	42	2	31	26	27	30	26	77	2.53	— 0.7	13	5,162	s.	32	w.	24	12	3	16	6.0	1.0
Elkins	1,940	41	50	.....	.....	.....	30.6	.....	63	12	42	0	31	20	38	....	....	...	3.64	.....	16	4,428	w.	32	s.	11	9	8	14	6.1	10.1
Lower Lake Region.							30.3	— 0.2										76	3.55	+ 0.7								7.6	
Buffalo	768	178	206	29.15	30.01	— .04	31.1	+ 1.3	63	12	36	3	30	26	26	28	22	71	5.06	+ 1.7	17	14,514	w.	64	w.	12	0	13	18	7.8	28.7
Oswego	335	76	87	29.63	30.01	— .04	30.4	+ 1.0	62	12	37	1	30	24	24	27	24	78	5.96	+ 2.6	21	10,371	se.	42	se.	12	3	7	21	7.9	30.7
Rochester	523	81	90	29.42	30.01	— .04	29.8	+ 1.2	62	12	36	2	30	24	26	27	22	75	3.78	+ 0.9	21	6,806	sw.	37	sw.	12	2	9	20	8.2	21.5
Erie	714	92	102	29.24	30.04	— .02	31.8	— 0.6	62	12	37	4	31	26	26	29	25	80	4.22	+ 1.0	18	11,667	sw.	39	s.	11	1	7	23	8.2	22.4
Cleveland	762	190	201	29.20	30.06	— .02	30.8	— 0.4	62	11	38	4	31	24	25	27	22	71	2.85	+ 0.2	15	13,937	sw.	52	w.	24	4	8	19	7.4	15.4
Sandusky	629	62	74	29.35	30.07	— .02	30.4	— 2.1	63	11	37	2	30	24	22	27	22	74	1.94	— 0.5	13	7,412	sw.	30	nw.	13	3	5	23	7.9	6.4
Toledo	628	123	128	29.35	30.06	— .02	29.4	— 1.3	60	11	36	— 1	30	23	23	26	22	77	2.31	— 0.1	14	8,699	sw.	42	sw.	12	7	8	16	6.5	6.5
Detroit	730	160	166	29.21	30.04	— .03	28.6	— 0.9	59	11	34	0	30	23	23	26	22	78	2.30	— 0.3	12	9,384	sw.	50	sw.	12	5	11	15	7.0	4.0
Upper Lake Region.							24.4	— 0.1										82	2.29	+ 0.1								6.7	
Alpena	609	61	65	29.27	29.96	— .07	25.2	+ 0.4	50	12	31	— 7	30	20	24	23	20	83	1.94	— 0.5	17	8,872	nw.	36	sw.	12	3	4	24	8.1	7.3
Escanaba	612	43	57	29.28	29.98	— .05	23.0	+ 1.6	46	21	30	— 4	30	16	30	20	17	81	1.04	— 0.9	6	8,151	w.	35	n.	11	10	7	14	6.1	0.4
Grand Haven	638	55	64	29.29	30.00	— .04	29.8	+ 0.2	57	11	35	4	30	25	23	28	26	86	3.34	+ 0.7	17	10,215	nw.	52	sw.	12	5	2	24	7.8	10.2
Marquette	734	67	95	29.10	29.94	— .09	23.1	+ 0.3	50	21	28	— 2	31	18	27	21	19	90	4.41	+ 2.0	20	9,505	w.	33	ne.	12	3	6	22	8.2	40.8
Port Huron	639	70	108	29.31	30.04	— .02	27.3	— 0.5	59	11	32	— 2	30	22	21	26	23	86	2.35	0.0	14	9,770	s.	48	sw.	12	10	3	18	6.7	7.3
Sault Ste. Marie	614	40	61	29.23	29.93	— .07	19.8	— 2.8	43	23	27	—17	30	13	35	19	17	88	3.08	+ 1.0	14	7,332	se.	42	nw.	19	2	9	20	7.8	11.0
Chicago	824	241	274	29.15	30.08	+ .01	27.2	— 2.1	56	11	34	— 3	30	21	22	25	21	78	1.81	— 0.5	9	13,758	w.	56	sw.	12	7	11	13	6.3	3.5
Milwaukee	681	124	142	29.28	30.05	— .02	26.3	+ 0.7	49	10	32	— 3	30	20	25	23	17	69	2.25	+ 0.3	10	9,219	w.	36	sw.	11	12	6	13	5.3	6.1
Green Bay	617	49	57	29.33	30.04	— .02	23.2	— 0.6	45	8	29	— 6	30	18	21	20	16	77	1.54	— 1.0	7	7,625	w.	30	nw.	24	11	10	10	5.5	2.6
Duluth	702	95	106	29.24	30.05	— .03	19.2	+ 1.4	48	23	26	—13	30	13	35	16	13	79	1.18	— 0.2	11	7,852	nw.	40	nw.	29	14	11	6	4.8	5.7
North Dakota.							13.5	+ 0.3										81	0.63	0.0								4.8	
Moorhead	905	54	60	29.06	30.16	+ .01	13.6	+ 1.7	46	23	22	—16	30	5	36	12	10	89	0.50	— 0.2	5	7,488	nw.	36	nw.	24	14	10	7	4.3	5.1
Bismarck	1,674	16	29	28.32	30.23	+ .09	14.2	— 0.5	51	1	24	—21	31	4	33	11	6	71	0.64	0.0	7	5,598	nw.	36	nw.	23	14	5	12	5.3	6.1
Williston	1,872	15	31	28.09	30.22	+ .05	12.8	— 0.2	47	1	23	—22	31	3	37	11	8	82	0.76	+ 0.1	9	5,809	n.	36	nw.	22	17	6	8	4.9	7.6

TABLE I.—*Climatological data for Weather Bureau Stations, December, 1899*—Continued.

Stations.	Elevation of instruments: Barometer above sea level, feet.	Elevation of instruments: Thermometers above ground.	Elevation of instruments: Anemometer above ground.	Pressure, in inches: Mean actual, 8 a. m. and 8 p. m. + 2.	Pressure, in inches: Mean reduced.	Pressure, in inches: Departure from normal.	Temperature of the air, in degrees Fahrenheit: Mean max. and min. + 2.	Temperature: Departure from normal.	Temperature: Maximum.	Temperature: Date.	Temperature: Mean maximum.	Temperature: Minimum.	Temperature: Date.	Temperature: Mean minimum.	Temperature: Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches: Total.	Precipitation: Departure from normal.	Precipitation: Days with .01, or more.	Wind: Total movement, miles.	Wind: Prevailing direction.	Wind: Maximum velocity: Miles per hour.	Wind: Maximum velocity: Direction.	Wind: Maximum velocity: Date.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
Upper Miss. Valley.							26.7	— 1.7										77	1.97	— 0.1									5.2	
Minneapolis	.....	99	208	.....	.....	.....	21.4	+ 1.3	51	23	28	— 9	30	14	35	....	....	....	1.37	— 1.0	6	9,728	nw.	45	nw.	23	7	12	12	....	1.9
St. Paul	837	114	124	29.13	30.09	— .02	21.2	+ 2.4	50	23	28	— 8	30	15	32	18	14	77	1.35	+ 0.1	7	7,148	nw.	40	nw.	24	8	12	11	5.8	1.6
La Crosse	720	70	78	.....	.....	.....	20.2	— 3.4	50	7	27	— 8	30	13	38	....	....	....	2.08	+ 0.6	8	5,949	s.	32	nw.	24	14	8	9	4.8	16.7
Davenport	606	71	79	29.42	30.11	— .01	25.8	— 2.0	52	11	33	— 3	30	19	28	23	19	79	2.68	+ 1.0	10	6,354	w.	30	nw.	24	14	9	8	4.7	1.8
Des Moines	867	84	88	29.19	30.18	+ .04	23.6	— 3.2	52	1	32	— 5	31	15	36	21	17	78	2.12	+ 0.7	9	5,843	nw.	27	n.	11	8	9	14	6.2	10.2
Dubuque	698	101	109	29.31	30.11	+ .01	23.5	— 2.4	48	8	30	— 5	30	17	27	21	19	85	1.85	0.0	7	6,466	nw.	42	nw.	24	10	11	10	5.2	3.5
Keokuk	614	63	78	29.45	30.14	+ .02	28.4	— 1.4	56	10	36	— 2	31	21	32	25	20	78	1.67	— 0.3	9	6,503	nw.	34	sw.	5	14	8	9	4.5	2.5
Cairo	359	87	93	29.77	30.17	+ .04	36.4	— 2.8	61	11	44	11	31	29	25	32	28	77	3.84	+ 0.5	12	7,177	nw.	42	sw.	12	6	15	10	6.0	1.5
Springfield, Ill.	644	82	92	29.42	30.14	+ .01	30.6	— 2.2	56	11	38	0	31	23	28	26	21	75	1.87	— 0.9	9	8,105	nw.	32	nw.	24	10	11	10	5.1	4.7
Hannibal	534	75	110	.....	.....	.....	29.7	— 2.2	59	10	38	2	31	21	32	....	....	....	1.26	— 0.3	12	7,292	nw.	35	sw.	5	14	8	9	4.4	3.6
St. Louis	567	111	210	29.52	30.16	+ .03	33.0	— 2.6	60	2	40	6	31	26	25	29	24	70	1.55	— 1.3	12	8,276	w.	38	sw.	11	9	12	10	5.7	6.1
Missouri Valley.							25.7	— 3.1										75	1.20	0.0									5.6	
Columbia	783	4	84	.....	.....	.....	28.8	— 6.3	61	10	39	— 6	15	18	33	....	....	....	2.29	+ 0.3	16	6,371	nw..	33	nw.	3	7	8	16	6.3	13.4
Kansas City	963	78	95	29.11	30.19	+ .03	30.2	— 1.7	56	1	37	8	30	23	31	27	22	74	1.33	— 0.2	12	6,239	nw.	32	nw.	11	8	10	13	5.7	3.9
Springfield, Mo	1,324	100	103	28.70	30.17	+ .05	32.6	— 6.0	62	2	40	— 1	15	25	30	29	25	76	1.86	— 1.0	9	8,008	nw.	31	se.	9	9	13	9	5.6	4.8
Topeka	.....	81	.....	.....	.....	.....	30.3	— 4.5	60	1	38	6	15	22	33	....	....	....	0.92	0.0	12	.....	n.	....	.....	...	8	13	10	5.8	2.0
Lincoln	1,199	75	84	28.83	30.19	+ .04	25.8	— 4.6	56	1	34	2	30	18	34	22	19	77	1.31	0.6	9	7,589	n.	40	n.	3	9	10	12	5.6	3.1
Omaha	1,105	115	121	28.92	30.17	.00	25.7	— 1.0	54	23	33	0	30	18	29	23	19	79	1.29	+ 0.3	6	6,783	sw.	35	n.	3	8	9	14	6.1	1.5
Sioux City	1,139	96	164	.....	.....	.....	23 0	— 1.1	56	23	31	— 5	30	15	33	....	....	....	1.27	+ 0.1	5	8,501	nw.	40	nw	3	10	9	12	5.5	1.1
Pierre	1,572	11	19	28.43	30.21	+ .04	20.8	— 4.4	59	1	29	— 5	30	11	32	16	10	68	0.41	0.0	6	5,592	nw.	44	nw.	31	10	11	10	5.5	3.9
Huron	1,306	56	67	28.70	30.30	+ .02	17.0	— 2.2	59	1	30	—18	31	5	44	13	8	77	0.19	— 0.4	6	7,027	nw.	41	nw.	23	16	7	8	4.5	1.5
Yankton	1,234	52	58	.....	.....	.....	23.0	+ 0.5	58	20	33	— 7	30	13	39	....	....	....	1.08	+ 0.3	6	5,977	nw.	36	s.	8	9	12	10	5.5	4.3
Northern Slope.							24.0	0.9										75	0.65	0.2									5.8	
Havre	2,494	46	47	27.38	30.13	— .02	30.8	+ 0.2	54	7	29	—24	17	13	45	19	16	83	1.33	+ 0.8	11	8,789	sw.	42	sw.	20	6	12	13	6.5	8.3
Miles City	2,371	42	50	27.53	30.16	.00	21.4	+ 2.1	56	1	30	—12	17	12	36	19	18	97	0.35	0.0	5	3,883	s.	30	nw.	2	16	9	6	4.2	2.3
Helena	4,108	88	93	25.85	30.22	+ .05	25.6	+ 0.3	53	24	32	—10	16	19	34	22	16	69	0.62	— 0.3	8	4,863	sw.	40	sw.	25	3	9	19	7.3	10.2
Kalispell	2,964	45	51	26.97	30.18	.....	26.2	.....	50	24	32	0	18	20	23	25	22	86	1.75	.....	15	3,328	nw.	25	sw	21	1	8	22	8.3	14.0
Rapid City	3,251	46	50	26.61	30.15	— .02	23.8	— 6.4	58	1	34	—11	13	14	37	20	16	77	0.81	+ 0.6	10	4,741	nw.	36	nw.	2	11	9	11	5.4	8 8
Cheyenne	6,084	56	64	23.96	30.22	+ .07	29.4	+ 0.9	58	29	41	4	15	18	37	23	8	47	0.18	— 0.1	4	9,135	nw.	48	nw.	2	13	11	7	4.7	1.8
Lander	5,372	28	36	24.66	30.30	+ .13	19.8	— 3.6	56	1	34	—11	21	6	44	15	10	72	0.94	+ 0.5	2	2,235	sw.	22	se.	2	10	18	3	4.5	9.4
North Platte	2,836	43	52	27.13	30.23	+ .06	27.5	+ 0.4	62	1	40	2	14	15	44	21	16	71	0.32	— 0.2	8	5,426	w.	36	nw.	23	10	14	7	5.1	4.4
Middle Slope.							32.3	2.6										72	1.21	0.3									4.9	
Denver	5,290	79	151	24.71	30.24	+ .08	30.3	— 1.7	61	1	43	— 5	15	18	42	24	13	55	0.72	+ 0.1	6	6,802	s.	47	nw.	1	18	9	4	3.2	10.9
Pueblo	4,682	80	86	25.31	30.21	+ .10	29.6	— 4.1	66	1	43	—14	15	16	54	24	18	66	1.06	+ 0.5	3	4,717	nw.	46	n.	2	18	8	5	4.3	12.2
Concordia	1,398	42	47	28.63	30.20	+ .07	30.4	— 2.6	60	1	38	10	15	23	35	26	22	79	1.36	+ 0.9	7	5,084	s.	27	n.	3	11	9	11	5.3	3.2
Dodge	2,504	44	52	27.46	30.19	+ .05	32.6	0.0	67	2	43	— 3	14	22	38	27	24	80	0.62	0.0	6	6,545	nw.	34	n.	2	9	10	12	6.1	5.9
Wichita	1,351	78	85	28.69	30.19	+ .08	33.3	— 4.6	65	2	42	4	15	25	30	28	23	79	1.81	+ 0.9	8	6,306	n.	30	nw.	2	13	8	10	5.0	9.7
Oklahoma	1,218	54	62	28.82	30.17	+ .06	37.6	— 2.9	65	2	46	16	14	29	28	33	29	75	1.71	— 0.7	7	8,368	n.	37	n.	2	14	3	14	5.3	3.5
Southern Slope.							40.2	— 1.6										73	2.17	+ 1.0									5.2	
Abilene	1,749	45	54	28.28	30.17	+ .02	44.5	— 3.0	78	2	54	24	29	35	32	38	33	73	3.24	+ 1.8	7	6,843	nw.	36	nw.	2	11	13	7	5.2	2.0
Amarillo	3,691	54	61	26.29	30.18	+ .05	36.0	— 0.3	67	2	46	11	14	26	33	31	26	73	1.11	+ 0.3	3	4,752	n.	36	n.	2	12	8	11	5.2	5.4
Southern Plateau.							46.1	+ 1.1										41	0.20	— 0.8									3.4	
El Paso	3,767	10	110	26.24	30.15	+ .04	44.9	— 1.2	74	2	57	22	22	33	40	34	21	48	0.21	— 0.3	4	7,823	nw.	48	ne.	19	11	14	6	4.7	1.5
Santa Fe	6,998	47	50	23.25	30.17	+ .05	32.7	+ 1.9	51	26	42	8	14	24	25	24	10	45	0.13	— 0.7	5	4,615	ne.	29	nw.	31	17	10	4	3.4	1.3
Flagstaff	6,885	12	25	23.36	30.22	.....	32.4	.....	62	1	46	— 1	21	19	45	28	....	....	0.99	.....	4	.....	e.	...	.....	...	9	13	9	....	....
Phenix	1,076	47	57	28.89	30.04	— .05	53.0	+ 0.4	75	6	67	28	14	39	39	41	26	38	0.08	— 1.0	2	2,456	e.	23	nw.	9	17	8	6	3.7	
Yuma	141	16	50	29.87	30.02	— .01	56.6	+ 0.6	77	1	69	35	11	44	35	43	26	34	T.	— 0.5	0	5,550	n.	40	n.	6	20	8	3	2.5	
Independence	3,907	51	58	26.07	30.12	+ .02	43.1	+ 3.8	67	24	54	21	20	32	29	34	18	39	0 56	— 1.4	4	6,147	nw.	33	n.	8	21	9	1	2.5	0.4
Middle Plateau.							29.9	2.9										70	0.79	0.9									5.5	
Carson City	4,720	82	92	25.36	30.26	+ .13	32.8	— 1.9	63	1	43	13	7	22	43	29	25	78	1.22	— 1.0	6	4,606	sw.	60	sw.	11	1	12	18	7.2	8.0
Winnemucca	4,340	59	70	25.79	30.32	+ .13	27.6	— 3.5	60	1	38	2	20	18	40	25	20	72	0.53	— 0.8	9	6,432	ne.	50	se.	15	9	9	13	6.2	4.3
Cedar City	5,850	36	47	24.32	30.28	.....	31.8	.....	63	1	42	7	14	22	35	26	17	60	1.18	.....	7	3,465	se.	34	sw.	15	17	3	11	4.3	12.4
Salt Lake City	4,360	105	110	25.77	30.35	+ .13	29.4	— 3.4	59	1	37	9	21	22	24	26	20	73	0.61	— 1.0	11	2,779	se.	36	n.	2	11	9	11	5.5	5.4
Grand Junction	4,608	43	50	25.51	30.40	.....	22.8	.....	50	1	34	0	15	12	32	18	12	69	0.76	.....	5	2,633	nw.	20	se.	29	14	6	11	4.4	8.1
Northern Plateau.							29.9	0.9										61	1.61	0.4									7.1	
Baker City	3,470	49	55	26.55	30.29	+ .12	24.4	— 4.1	50	1	31	6	14	18	22	22	18	77	1.64	— 0.1	10	4,012	s.	21	ne.	1	2	11	18	7.3	15.9
Boise	2,736	61	68	27.35	30.32	+ .09	30.1	— 3.1	53	1	37	7	20	23	36	28	24	79	0.82	— 1.1	8	3,106	se.	24	se.	15	7	10	14	6.5	6.6
Pocatello	4,482	48	56	25.61	30.34	+ .12	24.2	+ 1.2	52	1	33	— 2	21	16	32	22	19	78	1.32	— 0.2	9	8,172	s.	48	s.	15	10	4	17	6.4	11.9
Spokane	1,943	99	107	28.04	30.16	+ .04	33.2	+ 1.9	50	23	38	13	19	28	18	32	29	83	1.77	— 0.8	14	4,078	sw.	30	sw.	11	1	17	13	6.4	9.1
Walla Walla	1,018	65	73	29.03	30.16	+ .07	37.4	— 0.3	63	23	43	9	19	32	24	35	34	88	2.51	+ 0.3	12	3,927	s.	30	sw.	11	1	17	13	6.4	
N. Pac. Coast Reg.							43.4	+ 1.5										86	7.25	0.0									7.9	
Fort Canby ‡	179	10	34	29.75	29.95	— .01	44.8	+ 1.0	55	7	48	35	15	41	11	43	41	86	7.55	+ 2.2	14	5,750	e.	76	se.	7	2	2	12	7.7	
Neah	50	7	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Crescent	256	15	20	.....	.....	.....	40.8	+ 1.4	60	22	46	27	16	35	21	....	....	....	6.11	— 0.8	23	2,549	sw.	22	sw.	21	0	13	18	8.1	T.
Seattle	119	114	121	29.93	30.06	+ .03	44.1	+ 2.3	58	23	48	31	19	40	14	42	39	84	3.90	— 1.6	21	4,906	se.	27	s.	11	0	5	26	8.9	0.1
Tacoma	213	113	120	.....	.....	.....	42.7	+ 1.8	56	22	47	28	19	38	19	....	....	....	7.05	— 0.3	24	4,869	sw.	29	sw.	7	0	4	27	9.0	
Astoria	.....	18	.....	.....	.....	.....	45.9	+ 1.9	58	21	51	33	19	41	18	....	....	....	13.30	+ 2.1	26	.....	e.	....	.....	...	1	3	27	....	
Portland, Oreg	153	208	213	29.93	30.10	+ .02	43.1	+ 1.8	58	23	48	30	28	38	16	41	39	84	5.91	— 1.9	21	6,357	se.	44	s.	1	2	9	20	7.8	
Roseburg	521	56	67	29.52	30.10	— .01	42.6	+ 0.6	59	21	48	27	19	37	20	41	39	89	6.92	+ 0.5	19	2,148	se.	22	sw.	11	7	11	13	6.1	1.6
Mid. Pac. C'st Reg.							47.6	— 0.9										84	4.02	— 1.6									5.6	
Eureka	64	60	69	30.08	30.14	+ .07	48.0	+ 0.2	61	1	54	33	19	42	22	46	44	86	7.05	— 1.1	14	3,739	se.	39	se.	7	7	10	14	6.2	
Mount Tamalpais	2,375	11	18	27.62	30.12	.....	47.7	.....	64	23	52	34	17	43	18	45	41	80	4.65	.....	13	17,782	ne.	76	n.	6	16	4	11	4.6	
Red Bluff	334	54	58	29.78	30.14	+ .02	45.5	— 1.2	70	22	52	27	24	38	28	42	39	83	3.80	— 1.5	13	3,891	se.	34	se.	15	8	14	9	5.7	
Sacramento	71	106	117	30.07	30.15	+ .04	43.9	— 3.2	58	11	48	31	18	39	18	42	40	87	2.91	— 1.2	10	5,401	s.	38	s.	14	4	3	24	8.2	
San Francisco	153	161	167	29.98	30.14	+ .04	49.6	— 1.8	63	5	55	37	28	44	18	47	44	83	2.65	— 2.4	10	6,430	n.	30	sw.	15	18	6	7	3.8	
Point Reyes Light	.....	12	16	.....	.....	.....	51.2	+ 1.3	68	23	57	39	17	46	23	....	....	....	3.70	— 1.7	10	9,023	nw.	48	nw.	8	15	1	15	4.9	
S. Pac. Coast Reg.							53.6	+ 0.9										71	1.79	— 1.2									4.6	
Fresno	332	67	70	29.79	30.15	+ .03	43.8	— 2.5	62	30	48	32	27	39	21	43	42	94	1.09	— 0.4	10	2,921	s.	20	nw.	5	1	5	25	8.6	
Los Angeles	330	74	82	29.69	30.04	— .01	57.8	+ 2.4	82	1	70	37	19	46	32	49	42	61	0.90	— 3.1	4	2,515	n.	16	nw.	8	13	13	5	3.7	
San Diego	87	94	102	29.94	30.04	— .01	58.7	+ 2.9	80	22	66	46	10	51	28	50	43	63	0.65	— 1.5	3	3,207	ne.	22	ne.	22	24	2	5	2.6	
San Luis Obispo	201	10	46	29.89	30.11	+ .05	54.3	+ 0.9	80	24	66	33	28	43	40	47	41	65	4.51	0.0	7	3,644	n.	22	s.	15	17	5	9	3.6	
West Indies.																															
Basseterre	29	41	54	29.92	29.95	.....	76.8	.....	85	1	83	64	21	71	21	70	66	70	3.12	.....	9	6,158	ne.	24	ne.	11	18	13	0	3.2	
Bridgetown	30	57	65	29.88	29.91	.....	78.9	.....	87	19	85	68	15	72	17	74	72	80	2.34	.....	9	4,186	ne.	20	se.	31	4	20	7	5.8	
Cienfuegos	52	62	67	29.97	30.02	.....	70.6	.....	85	11	80	52	26	62	25	65	63	87	0.58	.....	3	5,335	ne.	22	w.	24	20	10	1	2.4	
Havana	57	83	100	29.99	30.05	.....	71.3	.....	83	12	77	55	31	65	21	65	63	79	1.14	.....	7	7,886	e.	38	ne.	7	14	13	4	3.6	
Kingston	286	38	52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port of Spain	40	65	66	29 84	29.88	.....	79.2	.....	89	5	87	67	31	72	19	74	71	78	5.52	.....	11	2,393	ne.	15	ne.	15	8	16	7	5.3	
Puerto Principe	352	55	62	29.65	30.00	.....	69.6	.....	82	28	78	49	26	61	27	65	64	90	3.72	.....	13	5,148	ne.	27	e.	11	11	12	8	4.7	
Roseau	25	37	47	29.90	29.92	.....	78.4	.....	88	5	85	68	14	72	16	70	67	70	1.68	....	8	3,856	ne.	19	se.	10	13	10	8	4.7	
San Juan	82	48	73	29.89	29.97	.....	76.0	.....	88	2	82	65	26	70	15	70	67	74	2.10	— 2.2	10	7,432	ne.	31	ne.	7	18	11	2	3.3	
Santiago de Cuba	82	45	51	29.88	29.96	.....	74.6	.....	87	6	83	61	31	67	21	67	65	80	2.30	.....	8	4,635	ne.	26	sw.	1	9	21	1	4.8	
Santo Domingo	57	37	44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Willemstad	75	39	46	29.82	29.89	.....	79.7	.....	87	6	84	69	21	76	11	73	71	75	3.89	.....	14	7,284	e.	22	ne.	27	5	15	11	6.2	

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record. *Two or more dates. †Received too late to be considered in departures, etc. ‡Record for 16 days. Station discontinued December 16, 1899.

TABLE II.—*Climatological record of voluntary and other cooperating observers, December, 1899.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Alco[c]	74	28	52.0	.....	
Ashville	67	19	43.0	6.10	T.
Bermuda	75	25	50.2	5.44	
Birmingham	68	30	46.0	7.20	
Bridgeport	.....	.....	.....	7.41	
Citronelle	71	29	51.4	5.97	
Clanton	67	23	45.7	6.13	
Daphne	73	29	49.6	5.10	T.
Decatur	69	15	41.9	6.67	
Demopolis	.....	.....	.....	5.59	2.0
Eufaula[a]	71	22	47.6	3.61	
Eufaula[c]	.....	.....	.....	3.64	
Eutaw	71	22	45.9	6.07	2.2
Evergreen	72	25	50.2	4.94	
Florence[a]	.....	.....	.....	8.79	
Florence[b]	64	15	40.6	8.49	
Fort Deposit	71	23	48.2	4.39	1.0
Gadsden	68	16	42.6	7.16	
Goodwater	69	19	43.2	5.85	0.5
Greensboro	70	24	44.8	6.02	2.0
Hamilton	68	14	42.4	6.74	1.0
Healing Springs	78	25	49.4	4.69	
Highland Home	71	27	49.2	3.41	
Jasper	.....	15	.....	6.61	T.
Lock No. 4	64	19	41.8	7.01	0.6
Madison Station	65	14	41.6	6.96	
Maplegrove	66	14	39.5	6.05	
Marion	75	20	48.4	8.20	2.0
Mount Willing	.....	.....	.....	4.09	
Newbern	71	23	46.2	5.58	2.5
Newburg	.....	15	.....	7.05	
Newton	67	22	45.2	4.52	
Oneonta	65	12	42.2	4.79	T.
Opelika	68	21	45.0	5.96	3.0
Oxanna	71	19	42.4	5.91	1.0
Pushmataha	74	23	46.8	3.51	2.0
Riverton	68	15	39.9	8.16	
Rockmills	67	19	44.6	5.15	T.
Scottsboro	.....	.....	.....	7.57	T.
Selma	74	22	46.2	5.59	2.0
Talladega	64	19	44.0	6.10	T.
Tallassee	.....	.....	.....	4.79	0.5
Tuscaloosa	70	21	43.7	7.88	2.6
Tuskegee	71	21	46.0	4.57	2.9
Union Springs	68	24	45.2	4.58	0.5
Uniontown	79	26	48 6	7.51	2.0
Valleyhead	64	14	40.0	6.70	T.
Warrior	.....	.....	.....	6.33	
Wetumpka	70	23	46.0	4.62	0.9
Arizona.					
Allaire Ranch	.....	.....	.....	0.11	
Arivaca	95	22	54.0	0.04	
Arizona Canal Co. Dam	80	30	57.6	0.00	
Aztec[*1]	75	38	53.8	0.13	
Benson[*1]	69	27	49.9	0.00	
Bisbee	72	25	47.8	0.06	
Blaisdell[*1]	78	37	58.8	T.	
Bowie[*1]	68	30	48.7	T.	
Buckeye	77	25	51.8	0.20	
Camp Creek	72	29	51.7	0.32	
Casagrande[*1]	78	32	52.7	0.00	
Champie Camp	84	27	54.5	0.20	
Cochise	.....	.....	.....	0.00	
Congress	74	35	54.4	0.31	
Dragoon Summit	.....	.....	.....	0.06	
Dudleyville	71	23	46.6	0.08	
Fort Apache	63	9	36.8	1.60	
Fort Defiance	55	0	30.2	0.80	4.5
Fort Grant	82	25	49.8	0.17	
Fort Huachuca	72	16	46.5	T.	
Fort Mohave	.....	34	.....	0.06	
Gilabend[*1]	73	37	52.4	T.	
Holbrook	62	6	34.4	0.30	1.0
Ingleside	75	27	52.3	0.50	
Jerome	69	26	45.0	0.50	
Maricopa[*1]	70	28	48.0	T.	
Mesa	81	25	51.6	0.06	
Mount Huachuca	67	22	46.4	0.05	
Music Mountain	75	21	45.8	0.12	
Natural Bridge	.....	.....	.....	0.20	
Nogales	78	18	49.2	0.00	
Oracle	68	25	47.6	T.	
Oro	.....	.....	.....	0.29	
Pantano[*1]	78	34	49.8	T.	
Parker	.....	23	.....	0.01	
Phenix	74	20	50.1	0.12	
Pima	72	16	47.0	0.18	
Pinal Ranch	.....	.....	.....	0.19	
Prescott	71	8	39.0	0.60	
Russellville	.....	.....	.....	0.00	
San Carlos	77	25	48.2	0.15	
San Simon[*1]	62	22	37.4	0.00	
Sentinel[*1]	73	38	54.8	0.12	
Signal	79	22	51.2	0.02	
Silverking	.....	.....	.....	0.05	
Snowflake	68	3	32.8	T.	T.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arizona—Cont'd.	°	°	°	*Ins.*	*Ins.*
Strawberry	65	11	37.4	0.09	0.5
Supai	68	26	44.3	0.16	
Texas Hill[*1]	80	30	51.6	0.04	
Tonto	67	21	45.9	0.16	
Tuba	64	13	38.7	T.	
Tucson	78	22	51.4	T.	
Vail[*5]	82	30	53.4	0.00	
Walnut Grove	.....	.....	.....	0.02	
Whitehills	76	24	46.6	0.10	
Willcox[*1]	65	23	41.2	0.00	
Winslow	61	7	35.4	T.	
Yarnell	.....	.....	.....	0.37	
Arkansas.					
Amity	70	19	42.0	4.30	2.0
Arkadelphia	71	21	45.6	4.00	1.5
Arkansas City	.....	.....	.....	4.76	1.2
Batesville	67	12	40.0	4.41	
Beebranch	72°	11°	40.5°	4.30	T.
Blanchard Springs	72	18	44.8	3.50	T.
Brinkley	72	19	44.5	4.35	T.
Camden[a]	.....	.....	.....	5.92	2.0
Camden[b]	74	19	43.9	5.40	2.0
Canton	63	11	36.6	4.25	0.5
Conway	69	17	42.7	4.06	1.1
Corning	63	10	35.8	4.12	2.0
Dallas	69	19	43.0	3.54	1.8
Dardanelle	.....	.....	.....	4.41	
Elon	72	15	44.8	4.46	1.0
Fulton	.....	.....	.....	2.93	1.0
Hardy	65	13	37.8	4.08	0.5
Helena[a]	.....	.....	.....	5.00	1.0
Helena[b]	68	20	42.6	4.95	1.0
Hot Springs[a]	71	18	45.0	.....	
Jonesboro	66	13	39.2	5.23	0.8
Keesees Ferry	69	11	39.0	2.64	0.4
Lacrosse	62	13	38.0	.....	
Lonoke	66	17	41.6	5.77	1.8
Luna Landing	78	20	44.9	3.74	3.0
Lutherville	64	15	40.2	4.07	2.0
Malvern	67	17	42.7	.....	
Marianna	63	15	40.6	4.24	0.4
Marvell	66	18	41.6	4.20	1.2
Moore	.....	.....	.....	6.10	4.0
Mossville	56	9	33.0	6.64	1.0
Mount Nebo	61	14	37.9	4.76	4.0
Nashville[1]	69	22	45.5	1.90	0.8
New Gascony	68	18	42.8	3.72	3.2
Newport[a]	.....	.....	.....	4.45	0.1
Newport[b]	64	11	40.2	4.48	T.
Newport[c]	66	12	40.0	4.54	T.
Oregon	64	9	39.1	2.86	T.
Osceola	67	15	41.2	4.07	T.
Ozark	66	19	41.7	4.99	4.0
Pinebluff	70	18	42.4	5.41	3.0
Pocahontas	62	12	37.0	4.59	0.1
Pond	64	9	36.4	2.05	T.
Powell	69	11	35.9	2.63	
Rison	72	18	43.8	4.02	1.5
Silversprings	66	9	37.2	2.01	0.9
Spielerville	66	17	40.8	4.18	3.0
Stuttgart	66	16	41.8	4.16	2.1
Texarkana	70	22	44.8	2.38	
Washington	67	21	43.6	3.58	2.9
Wiggs	65	15	41.2	4.35	3.0
Winslow	65	8	35.4	3.52	6.4
Witts Springs	60°	12°	37.3°	3.15	0.5
California.					
Anada	64	19	40.1	15.28	.....
Angiola	65	29	43.9	1.17	
Arlington Heights	84	35	55.8	0.41	
Azusa	.....	.....	.....	1.75	
Bakersfield	69	21	45.1	0.77	
Ballast Point L. H	.....	.....	.....	0.75	
Bear Valley	.....	.....	.....	12.81	39.0
Berkeley	61	34	48.3	3.46	
Bishop	75	13	41.2	1.05	6.0
Boca[*1]	50	−7	23.7	4.53	33.0
Bodie	49	−17	21.0	2.57	20.0
Bowman[*1]	68	18	36.2	15.72	47.0
Cahto	.....	.....	.....	13.98	
Caliente[*1]	65	31	51.9	0.64	
Campbell	61	28	46.9	1.47	
Cape Mendocino L. H	.....	.....	.....	10.55	
Cedarville	56	9	29.4	1.85	8.5
Centerville[*1]	64	36	51.1	2.91	
Chico[*1]	73	34	48.0	4.20	
Cisco[*1]	52	16	32.1	12.14	51.0
Claremont	79	30	50.6	1.04	
Corning[*1]	65	36	47.5	3.42	
Coronado	72	48	58.4	.....	
Craftonville	81	32	52.6	0.52	
Crescent City	66	32	49.0	11.28	
Crescent City L. H	.....	.....	.....	8.39	
Cuyamaca	62	18	40.1	2.49	
Delano[*5]	62	33	44.8	1.01	
Delta[*1]	66	34	47.3	6.40	6.0

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Dewey	62	29	43.6	0.55	
Drytown	70	30	47.0	5.61	
Dunnigan[*1]	65	28	46.0	3.65	
Durham[*1]	66	30	44.4	4.13	
East Brother L. H	.....	.....	.....	1.80	
Edmanton[*1]	59	19	35.3	11.89	22.0
Elcajon	84	28	54.2	0.87	
Elmwood	60	32	43.4	1.62	
Elsinore	89	26	54.4	0.55	
Escondido	76	23	49.6	1.62	
Fallbrook[*1]	82	37	54.9	2.22	
Fordyce Dam	.....	.....	.....	8.26	67.0
Fort Bragg	.....	.....	.....	6.23	
Fort Ross	67	37	50.8	7.51	
Fort Tejon	.....	.....	.....	1.40	
Georgetown	70	28	46.3	11.91	2.0
Gilroy Hot Springs	.....	.....	.....	3.09	
Gilroy (near)	71	28	48.4	2.13	
Glendora	.....	.....	.....	1.18	
Goshen	.....	.....	.....	1.88	
Grand Island[*5]	62	33	46.3	3.32	
Grass Valley	.....	.....	.....	11.35	1.0
Greenville	58	10	34.8	6.92	15.5
Hanford	64	28	44.0	0.87	
Healdsburg	69	28	46.5	7.78	
Hill Ranch	74	29	50.4	1.42	
Hollister	69	26	47.2	1.70	
Humboldt L. H	.....	.....	.....	8.55	
Indio[*1]	78	33	53.6	.....	
Iowa Hill[*1]	71	31	47.8	8.15	1.5
Irvine	96	44	64.7	0.68	
Jackson	58	24	41.6	7.45	
Jolon	.....	.....	.....	2.30	
Keene[*1]	66	30	47.5	0.90	
Kennedy Gold Mine	58	25	41.4	6.41	
Kernville	.....	.....	.....	0.84	
King City[*1]	68	32	48.6	1.21	
Kingsburg[*5]	62	35	46.1	0.72	
Kono Tayee	58	33	45.6	4.14	
Lagrange	60	31	44.8	1.79	
Lamesa	.....	.....	.....	0.85	
Lankershim	64	30	44.0	0.80	
Laporte[*1]	55	17	35.7	16.23	52.9
Las Fuentes Ranch	.....	.....	.....	2.12	
Legrand	.....	32	.....	2.15	
Lemoncove	65	29	46.2	1.67	
Lemoore[a][*1]	65	30	43.6	1.08	
Lick Observatory	72	27	45.6	4.16	8.2
Lime Point L. H	.....	.....	.....	3.03	
Lodi	59	31	45.4	2.18	
Los Gatos[b]	60	33	47.0	3.46	
Malakoff Mine	70	26	45.1	13.09	8.5
Mammoth[*1]	78	36	55.6	T.	
Manzana	73	32	49.4	0.29	
Mare Island L. H	.....	.....	.....	3.43	
Merced[b]	60	32	43.0	1.80	
Mills College	.....	.....	.....	3.25	
Milo	.....	.....	.....	3.31	
Milton (near)[*1]	59	30	44.4	3.02	
Modesto[*1]	76	36	47.4	1.38	
Mohave[*1]	66	29	45.4	0.31	
Mokelumne Hill[*3]	.....	29	42.8	6.09	
Monterio	76	32	53.6	1.54	
Monterey[*1]	69	30	52.8	1.39	
Morena Dam	.....	.....	.....	1.38	
Mountainview	.....	.....	.....	1.83	
Mutah Flat	.....	.....	.....	2.25	
Napa[b]	65	31	46.2	3.80	
Needles	73	38	55.3	T.	
Nevada City	68	25	43.2	10.27	3.0
Newhall[*1]	80	29	51.7	0.64	
North Ontario	75	35	54.1	1.05	
North San Juan[*1]	70	27	45.4	12.41	3.5
Oakland[a]	61	31	47.8	3.20	
Ogilby[*5]	85	40	58.4	0.00	
Oleta[*1]	61	28	43.1	7.82	
Orland[*1]	64	30	44.5	2.69	
Palermo	59	30	44.1	3.72	
Paso Robles[b]	67	25	47.3	2.53	
Peachland[*5]	65	30	46.4	6.20	
Piedras Blancas L. H	.....	.....	.....	3.85	
Pigeon Point L. H	.....	.....	.....	1.21	
Pilot Creek	.....	.....	.....	12.56	18.0
Pine Crest	81	45	59.6	2.22	
Placerville	64	26	42.3	8.32	T.
Point Ano Nuevo L. H	.....	.....	.....	2.64	
Point Arena L. H	.....	.....	.....	5.52	
Point Bonita L. H	.....	.....	.....	4.29	
Point Conception L. H	.....	.....	.....	1.08	
Point Firmin L. H	.....	.....	.....	0.84	
Point George L. H	.....	.....	.....	5.09	
Point Hueneme L. H	.....	.....	.....	0.78	
Point Lobos	58	37	48.7	3.41	
Point Loma L. H	.....	.....	.....	0.44	
Point Montara L. H	.....	.....	.....	2.47	
Point Pinos L. H	.....	.....	.....	2.44	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Point Sur L. H	.....	.....	....	3.47	
Pomona (near)	80	32	54.2	0.95	
Poway[*2]	83	33	48.5	1.29	
Quincy	49	15	34.1	7.60	11.0
Ranch House	84	38	60.4	1.14	
Raymond	64	24	43.7	2.05	
Redding	73	31	46.6	4.18	T.
Redlands	83	35	55.9	0.46	
Reedly	64	20	42.0	1.05	
Represa	60	32	45.8	4.39	
Riovista	61	31	43.4	1.87	
Roe Island L. H	.....	.....	.....	2.72	
Romie	78	27	50.3	1.73	
Rosewood	71	22	43.1	3.93	1.0
Sacramento[a]	61	34	45.3	3.40	
Salinas[*1]	75	33	58.6	1.62	
Salton[*5]	78	38	57.8	T.	
San Bernardino	85	28	54.2	0.84	
San Jacinto	76	27	51.6	0.75	
San Leandro[*1]	72	38	53.4	2.76	
San Luis L. H	.....	.....	.....	2.70	
San Mateo[*1]	64	35	49.3	2.57	
San Miguel[*1]	70	25	46.6	1.23	
Santa Barbara[a]	80	40	57.1	2.35	
Santa Barbara L. H	.....	.....	.....	2.76	
Santa Clara[a]	.....	.....	.....	1.59	
Santa Cruz[b]	72	31	49.6	4.42	
Santa Cruz L. H	.....	.....	.....	3.07	
Santa Maria	78	33	55.4	0.89	
Santa Monica[*1]	72	44	55.0	1.57	
Santa Paula	88	40	61.2	1.66	
Santa Rosa[*1]	64	28	47.3	4.78	
Shasta	76	27	46.5	6.38	0.8
Sierra Madre	78	40	57.1	1.01	
Snedden	.....	.....	....	0.27	
Sonoma	.....	.....	.....	4.23	
S. E. Farallone L. H	.....	.....	.....	3.45	
Stanford University	62	30	47.2	1.42	
Stockton[a]	67	32	43.6	1.84	
Summerdale	58	18	38.6	13.63	14.0
Susanville	50	8	29.0	3.59	26.0
Tehama[*1]	70	38	46.6	3.65	
Tejon Ranch	69	28	47.8	1.67	
Templeton[*1]	62	27	43.1	3.96	
Thermalito	65	30	44.8	3.78	
Trinidad L. H	.....	.....	.....	6.77	
Truckee[*1]	52	6	26.4	1.80	18.0
Tulare[b]	.....	.....	.....	2.21	
Tulare[c]	70	28	45.1	1.28	
Ukiah	68	24	46.2	6.94	
Upperlake	69	30	46.4	.....	
Upper Mattole[*1]	66	29	44.8	17.84	
Vacaville[a*1]	64	28	45.4	3.67	
Ventura	78	34	54.2	1.55	
Visalia[b]	65	29	45.7	1.29	
Volcano Springs[*1]	82	33	54.4	T.	
Walnut Creek	65	29	47.4	2.78	
West Palmdale	....	.....	.....	0.32	
Westpoint	.....	.....	.....	8.52	2.0
West Saticoy	....	.....	.....	0.96	
Wheatland	59	32	43.7	3.88	
Williams[*1]	65	37	48.7	3.01	
Wilmington[*1]	75	41	54.0	0.61	
Wire Bridge[*5]	62	30	46.0	6.06	
Yerba Buena L. H	.....	.....	.....	2.85	
Yreka	59	21	35.8	3.80	.....
Yuba City[*5]	62	35	48.0	3.62	
Colorado.					
Antlers	48	0	24.0	0.94	10.5
Arkins	....	.....	.....	0.49	7.0
Aspen	.....	.....	.....	1.22	17.5
Boulder	60	6	35.8	0.96	12.8
Boxelder	.....	.....	....	0.17	.....
Breckenridge	45	−18	14.0	1.20	21.7
Buenavista	.....	.....	.....	0.87	15.0
Canyon	66	− 1	37.2	0.76	12.5
Castlerock	60	−14	24.9	1.16	17.0
Cedaredge	58	− 3	27.6	1.06	11.0
Cheyenne Wells	63	1	28.0	0.55	4.0
Clearview[*1]	44	−10	21.5	1.57	24.0
Colorado Springs	61	− 6	31.6	0.55	11.0
Cope	62	− 1	28.6	0.41	6.0
Crook	66	− 3	26.8	0.22	3.0
Delta	55	− 6	25.1	0.23	2.5
Dumont	.....	.....	.....	0.85	13.0
Durango	54	− 2	27.9	0.88	11.5
Fairview	58	−19	25.5	0.96	14.8
Fort Collins	64	− 9	28.0	0.47	6.0
Fox	.....	.....	.....	0.60	9.0
Garnett	49	−23	19.4	0.26	4.0
Georgetown	50	4	27.9	.....	.....
Gilman	....	.....	.....	1.45	23.2
Gleneyrie	60	− 6	31.8	1.01	13.5
Glenwood	.....	.....	.....	1.34	16.0
Greeley	64	−12	25.6	0.40	5.8
Gunnison	47	−35	9.3	1.21	16.8
Colorado—Cont'd.	°	°	°	*Ins.*	*Ins.*
Gypsum	.....	.....	.....	0.30	5.0
Hamps	62	−16	27.6	0.71	8.5
Hoehne	58	−11	31.8	0.56	8.0
Holly	.....	.....	.....	0.90	7.0
Holyoke (near)	65	− 5	28.4	0.09	2.0
Hugo	.....	.....	.....	0.56	8.0
Husted	61	−16	29 0	0.94	15.5
Lake Moraine	47	− 8	22.4	1.10	28.6
Lamar	64	−16	29.4	0.70	10.5
Laporte	.....	.....	.....	0.40	6.0
Las Animas	64	−22	28.0	1.10	14.0
Lay	53	−36	12.8	1.19	19.0
Leadville (near)[*1]	44	− 6	17.9	0.63	14.5
Leroy	64	− 3	27.4	0.44	5.5
Longs Peak	55	− 9	25.4	0.64	11.5
Mancos	57	−17	27.3	0.78	13.0
Marshall Pass	.....	.....	.....	2.25	37.0
Meeker	51	−29	14.7	1.46	22.8
Minneapolis	67	−10	27.8	0.99	12.0
Mitchell	.....	.....	.....	1.71	30.0
Montrose	.....	.....	.....	1.54	22.0
Moraine	49	−11	27.4	0.65	10.0
Pagoda	53	−27	16.8	1.93	29.5
Palmer	.....	.....	.....	1.15	17.5
Parachute	51	1	24.2	0.76	.....
Perrypark	.....	.....	.....	0.91	.....
Rangely	45	−31	6.6	0.79	12.5
Rockyford	66	−20	27.3	0.98	13.0
Ruby	.....	.....	.....	2.80	48.0
Saguache	48	−10	23.2	0.06	1.5
Salida	60	−26	26.4	1.10	17.5
San Luis	53	−12	25.5	0.23	3.9
Santa Clara[*1]	56	− 2	29.1	2.63	34.0
Sapinero	.....	.....	.....	1.19	23.5
Sargents	.....	.....	.....	1.93	31.0
Seibert	.....	.....	.....	0.57	7.5
Strickler Tunnel	.....	.....	.....	0.94	22.8
Trinidad	68	− 7	35.8	0.91	13.0
Troutvale	48	−42	13.1	0.90	17.5
T. S. Ranch	53	4	25.2	1.32	15.0
Twinlakes	.....	.....	.....	0.81	12.0
Vilas	.....	.....	.....	0.67	8.0
Wagon Wheel	50	−27	16.6	0.62	11.0
Walden	50	−35	13.6	0.89	14.8
Wallet	.....	.....	.....	0.37	6.0
Westcliffe	52	−10	27.0	1.42	19.0
Wray	64	− 5	29.5	0.33	3.5
Yuma	.....	.....	.....	0.27	4.5
Connecticut.					
Bridgeport	61	6	33.9	2 26	0.9
Canton	66	− 2	30.4	2.84	0.5
Colchester	61	3	34.4	2.32	T.
Falls Village	.....	.....	.....	2.35	2.5
Greenfield Hill	.....	.....	.....	2.51	0.7
Hartford[a]	.....	.....	.....	2.28	1.0
Hartford[b]	60	6	32.7	2.33	T.
Hawleyville	61	2	33.2	3.06	1.2
Middletown	62	3	32.4	2.81	2.7
New London	60	4	35.1	1.73	0.2
North Grosvenor Dale	65	− 1	31.0	2.21	T.
Norwalk	61	5	32.0	2.32	0.8
Southington	60	3	32.6	1.68	0.5
Storrs	61	0	32.0	2.14	T.
Voluntown	66	− 1	33.1	2.38	T.
Wallingford	.....	.....	.....	1.95	.....
Waterbury	62	3	32.9	2.81	T.
West Cornwall	54	0	29.7	2.21	1.2
West Simsbury	.....	.....	.....	2.84	0.5
Winsted[*1]	57	2	29.1	.....	.....
Delaware.					
Millsboro	65	1	37.8	1.79	1.5
Newark	65	5	34.2	1.92	0.5
Seaford	65	5	37.6	1.29	1.5
Wyoming	67[e]	3[e]	36.6[e]	2.51	1.5
District of Columbia.					
Distributing Reservoir[*5]	65	9	38.0	1.52	.....
Receiving Reservoir[*5]	65	4	40.5	1.60	.....
West Washington	71	1	35.9	1.62	2.0
Florida.					
Archer	79	25	55.9	1.57	
Bartow	80	34	61.0	1.95	
Brooksville	78	31	58.8	1.79	
Clermont	80	33	60.3	1.35	
Dalkeith	76	30	54.2	3.48	
De Funiak Springs	78	28	52.0	4.00	
Deland	79	29	58.9	.....	
Ernestville	80	30	60.2	1.80	
Estero[*1]	82	38	64.6	.....	
Eustis	80	31	60.0	1.28	
Federal Point	75	31	55.9	2.03	
Fort Meade	80	30	62.4	1.50	
Gainesville	78	29	55.0	1.15	
Homeland	76	34	58.2	.....	
Huntington	76	32	56.8	1.41	
Hypoluxo	81	41	69.3	.....	
Florida—Cont'd.	°	°	°	*Ins.*	*Ins.*
Inverness	81	31	57.6	1.84	
Jasper	76	28	52.8	1.49	
Kissimmee	80	35	63.4	1.60	
Lake City	78	28	55.8	1.59	
Lemon City	81	44	68.4	2.45	
Macclenny	81	23	53.2	1.05	
Manatee	81	34	61.4	2.51	
Merritt Island	78	38	64.3	2.48	
Middleburg	76	30	55.1	1.21	
Myers	82	38	64.2	0.58	
New Smyrna	78	31	59.2	3.50	
Nocatee	84	35	66.0	1.93	
Ocala	82	25	58.6	1.50	
Orange City	80	33	60.8	0.58	
Orlando	79	33	61.7	0.93	
Plant City	81	28	61.2	1.65	
Rockwell[f]	78	30	58.4	.....	
St. Andrews	72	30	54.3	2.26	
St. Francis	77	28	58.4	0.89	
St Francis Barracks	79	30	56.9	2.23	
Sebastian	76	38	64.2	4.86	
Stephensville[*1]	79	28	55.4	2.03	
Switzerland[*1]	76[d]	31[b]	53.3[c]	1.23	
Tallahassee	71	29	51.6	2.59	
Tarpon Springs	79	33	59.6	2.36	
Wausau	74	25	51.7	3.25	
Georgia.					
Adairsville	63	14	39.6	4.42	
Albany	74	26	49.8	2.55	
Americus	71	23	46.0	2.39	1.5
Athens[b]	66	17	41.0	2.78	
Blakely	70	26	50.3	2.96	
Canton	.....	.....	.....	5.15	
Carlton	.....	.....	.....	3.02	
Cedartown	65	17	43.6	4.76	
Clayton	68	10	39.0	5.84	T.
Columbus	65	26	46.0	3.59	
Covington	68	16	42.1	3.14	T.
Crescent	.....	.....	.....	1.33	T.
Dahlonega	66	8	39.4	5.01	T.
Diamond	65	.....	.....	6.06	1.0
Dublin	.....	.....	.....	2.75	
Elberton	67	16	44.6	3.28	
Fitzgerald	75	23	47.7	2.18	
Fleming	77	22	48.6	1.53	
Fort Gaines	71	26	49.0	3.28	
Franklin	66	22	45.1	5.48	1.0
Gainesville	64	15	40.9	4.49	
Gillsville	68	12	41.5	3.61	
Greenbush	.....	13	.....	6.56	T.
Harrison	70	21	44.9	2.95	4.0
Hephzibah[*6]	70	28	49 5	0.85	2.5
Jesup	80	19	50.8	1.68	
Louisville	73	23	47.5	2.48	
Lumpkin	68	24	48.5	3.66	1.0
Marshallville	68	21	46.9	2.87	2.5
Mauzy	80	24	51.6	1.90	
Morgan	72	24	48.0	2.71	
Newnan	.....	.....	.....	4.29	
Oakdale	.....	.....	.....	4.39	
Pelham	75	.....	.....	2.11	
Point Peter	64	17	39.8	3.14	
Poulan	79	22	49.0	2.53	
Putnam	69	22	46.2	2.80	3.0
Quitman	74	28	51.0	2 22	
Ramsey	65	11	42.0	4.07	T.
Resaca	.....	.....	.....	4.66	
Reynolds	.....	.....	.....	2.95	2.0
Rome	70	18	41.2	4.72	
Talbotton	71	21	45.3	4.88	2.0
Thomasville	77	28	52.4	2.05	
Toccoa	65	15	41.4	4.16	
Washington	.....	.....	.....	2.94	
Way Cross	75	24	50.6	1.07	
Westpoint	.....	.....	.....	3.70	1.5
Idaho.					
Albion	60	0	29.0	1.06	2.2
American Falls	52	−11	24.2	1.52	8.0
Atlanta	41	− 4	22.6	2.58	34.2
Blackfoot	51	−11	20.0	0.76	7.6
Burnside	41	−10	19.8	0.71	.....
Chesterfield	47	−32	13.6	1.55	16.0
Downey	50	−18	19.0	0 90	9.0
Fort Sherman	50	9	32.2	3.38	8.8
Garnet	61	7	35.3	0.37	T.
Gray	52	−10	29.3	1.80	18.0
Hagerman	53	− 9	29.8	1.26	6.6
Idaho City	47[d]	−10[b]	23.2[c]	5.12	51.2
Kootenai	54	− 1	27.2	1.59	16.0
Lake	40	− 4	23.1	1.00	10.0
Lakeview	52	18	33.6	3.18	.....
Lewiston	58	17	39.0	1.43	1.0
Lost River	42	−23	14.5	1.15	12.5
Marysville	58[d]	−16[b]	17.8[c]	0.96	9.6
Moscow	44	17	32.6	2.76	17.5
Murray	46	4	29.3	5.34	32.0

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Idaho—Cont'd.	°	°	°	*Ins.*	*Ins.*
Oakley	60	— 2	27.6	0.40	4.0
Oia	49	—11	25.4	2.55	24.1
Paris	50	—14	21.4	1.00	8.0
Payette	58	— 6	27.1	1.77	17.7
Pollock	55	19	36.0	0.54	.....
Priest River	50	10	31.8	1.74	11.8
St. Maries	49	17	33.7	4.57	13.5
Soldier	44	—28	15.6	1.50	15.5
Swan Valley	49	—20	21.0	0.62	6.9
Weston	53	—14	22.6	0.81	10.5
Yellow Jacket	.....	.....	.....	1.60	.....
Illinois.					
Albion	60	1	32.2	2.74	7.5
Alexander	58	— 2	30.4	1.48	6.0
Ashton	52	— 5	25.4	1.94	4.0
Astoria	59	— 1	29.2	2.02	7.8
Aurora *a*	53	— 4	26.7	1.61	4.1
Aurora *b*	53	— 3	26.0	1.71	3.6
Bloomington	58	— 3	28.7	2.15	5.0
Cambridge	52	— 4	25.3	2.44	7.0
Carlinville	58	— 1	30.2	2.38	8.0
Carlyle	.....	.....	.....	2.82	1.8
Centralia	66	3	32.6	2.94	10.0
Charleston	60	— 1	30.7	2.90	5.2
Chemung	49	— 6	24.2	1.98	3.0
Chester	.....	.....	.....	2.48	3.0
Cisne	62	— 1	32.6	2.14	7.2
Coatsburg	57	— 3	28.2	1.32	2.5
Cobden	60	4	33.0	4.17	2.2
Decatur	58	— 3	29.1	2.37	4.1
Dixon	52	— 4	26.2	1.81	2.0
Dwight	57	— 5	26.4	2.06	5.5
Effingham	60	— 4	30.6	3.38	12.2
Elgin	51	— 5	25.8	1.69	2.5
Equality	63	4	35.2	2.83	2.8
Flora	60	— 2	30.8	2.65	9.5
Fort Sheridan	.....	.....	.....	1.31	2.1
Friendgrove *1	60	6	34.8	2.83	4.3
Galva	53	— 5	25.8	1.71	4.7
Glenwood *1	57[f]	— 6[i]	24.5[e]	1.77	4.0
Grafton	.....	.....	.....	2.36	3.0
Grayville	61	6	35.2	2.75	6.0
Greenville	61	— 4	30 9	3.90	9.7
Griggsville	.....	0	.....	1.27	4.6
Halfway	60	4	34.2	2.55	3.2
Halliday	62	1	33.8	2.15	3.1
Havana	55	4	29.8	2.73	8.0
Henry	56	— 5	27.6	2.48	6.2
Hillsboro	58	— 3	30.0	3.48	6.1
Joliet	57	— 2	26.7	1.70	4.8
Kishwaukee	52[e]	3[e]	29.0[e]	2.23	2.5
Knoxville	58	— 6	25.6	2.64	2.5
Lagrange	55	— 4	26 6	1.63	3.0
Laharpe	55	— 3	28.2	1.17	2.5
Lanark	50	— 7	24.0	1.78	1.4
Loami	.....	.....	.....	1.66	5.2
McLeansboro	65[i]	4[i]	33.9[i]	2.36	6.0
Martinsville	60	2	30.2	2.55	8.2
Martinton	59	— 4	28.1	3.11	4.0
Mascoutah	60	1	30.5	3.41	9.0
Mattoon	60[c]	2[c]	31.8[c]	2.71	3.7
Minonk	57	— 5	27.0	2.31	6.5
Monmouth	54	— 6	25.8	1.43	2.0
Monticello *[b]	60	— 2	29.2	2.37	4.5
Morgan Park	.....	— 8	.....	2.55	3.8
Morrisonville	58	— 1	30.3	2.23	4.5
Mount Carmel	.....	.....	.....	3.33	10.3
Mount Pulaski	58	— 3	29.8	1.93	5.5
Mount Vernon	56	0	28.7	2.19	8.5
New Burnside	65	4	34.0	3.78	2.0
Olney	60	— 4	32.1	2.66	13.6
Ottawa	55	— 3	28.1	2.03	3.5
Palestine	59	— 5	31.3	3.62	11.2
Pana	61	— 2	30.6	3.00	5.5
Paris	63	— 1	29.4	2.83	.....
Peoria *a*	.....	.....	.....	2.73	17.8
Peoria *b*	57	— 1	29.4	2.12	5.0
Philo	59	— 3	28.5	2.56	4.0
Plumhill	60	4	32.6	2.46	5.6
Rantoul	58	— 3	28.0	1.58	2.0
Raum	62	5	35.4	5.27	3.5
Riley	50	— 6	24.4	1.56	3.0
Robinson	65	— 5	31.5	3.37	8.2
Roundgrove	51	— 4	24.4	1.95	5.0
St. Charles *1	50	— 5	24.2	1.93	4.2
St. John	65	3	34.4	2.08	3.0
Scales Mound	49	— 8	22.5	1.57	3.4
Shobonier	59	— 5	32.4	3.31	9.8
Strawn	58	— 3	27.9	2.73	2.0
Streator	55	— 5	27.3	1.93	.....
Sullivan	58	— 2	30.4	3.00	3.5
Sycamore	51	— 5	24.6	1.41	1.8
Tilden	59	3	31.7	1.89	5.2
Tiskilwa	54	— 6	25.7	1.63	3.0
Tuscola	59	— 2	28.6	2.86	4.0
Walnut	53	— 4	27.2	1.57	2.5
Wheaton *[a]	51	1	27.4	1.86	7.0
Winchester	57	1	29.0	1.56	4.0
Winnebago	51	— 5	24.6	1.98	4.0
Indiana.					
Anderson	61	0	29.8	2.67	6.7
Angola	56	— 5	26.6	3.31	11.9
Auburn	59	0	28.5	1.92	.....
Bedford	58	— 4	30.8	2.19	3.3
Bloomington	65	— 1	31.6	3.68	2.8
Bluffton	60	— 2	29.4	2.92	4.5
Boonville	64	0	31.6	2.63	.....
Bright	61	— 3	34.0	3.39	1.0
Butlerville	62	— 2	33.2	4.47	4.3
Cambridge City	61	—10	29.2	3.12	7.2
Columbus	60	— 4	31.0	2.75	6.5
Connersville	61	— 8	29.3	3.28	7.1
Culver	58	2	28.4	1.49	3.7
Delphi	59	— 1	27.6	3.08	5.0
Edwardsville *1	65	2	34.8	4.30	4.9
Fairmount	60	— 5	29.0	2.86	5.8
Farmland	60	— 3	29.7	3.01	8.8
Fort Wayne	60	— 1	28.2	3.16	7.3
Franklin *1	58	2	30.8	2.64	7.8
Greencastle	60	— 1	30.8	3.12	6.5
Greensburg	62	— 4	30.6	3.38	0.6
Hammond	53	— 3	26.3	1.51	7.0
Hector	60	— 2	30.2	2.84	8.5
Huntington	60	1	28.0	3.85	15.0
Jasper	60	.....	.....	2.12	0.3
Jeffersonville	63	6	34.6	3.92	2.0
Knightstown	60	— 3	29.1	3.20	6.0
Kokomo	59	0	29.8	2.88	5.2
Lafayette	59	— 4	29.0	3.34	3.1
Laporte	58	0	28.6	3.63	27.8
Logansport	56	0	29.2	1.82	.....
Madison	64	1	33.6	4.50	3.0
Marengo	62	— 3	32.8	4.68	5.6
Marion	60	— 1	29.2	3.47	6.0
Markle	61	— 2	29.7	2.80	6.5
Mauzy	61	— 7	29.8	3.35	9.4
Mount Vernon	74	6	36.2	3.53	2.3
Northfield	58	— 8	28.4	2.90	5.5
Paoli	62	— 2	32.0	3.91	5.7
Peru	60	— 2	31.4	2.62	4.4
Prairie Creek	58	— 3	31.0	2.35	7.3
Princeton	60	2	32.0	3.00	11.0
Richmond	60	—11	29.2	3.05	7.0
Rockport	62	6	37.0	3.88	2.5
Rockville	59	— 2	29.6	2.47	4.0
Salem	60	— 6	30.6	3.96	8.0
Scottsburg	62	1	33.4	4.34	4.5
Shelbyville	.....	.....	.....	3.08	6.8
South Bend	58	— 2	28.9	4.23	30.5
Terre Haute	59	1	30.8	2.66	6.7
Topeka	57	— 4	28.2	2.82	10.0
Valparaiso	54	— 4	25.9	1.60	11.0
Veedersburg	60[h]	— 2[c]	31.8[f]	2.46	3.1
Vevay	65	1	34.0	5.90	4.0
Vicennes	67	0	32.5	3.77	10.5
Washington	58	0	34.1	3.46	6.5
Winamac	68	1	28.8	2.40	7.3
Worthington	60	— 4	30.2	3.25	7.3
Indian Territory.					
Hartshorne	68	18	43.2	2.33	T.
Healdton	70	16	42.2	3.61	T.
Lehigh	67	19	42.8	1.67	0.5
Muscogee	68	15	39.2	3.16	4.0
Ryan	79	21	42.4	2.77	T.
Sapulpa [b]	63	14	41.4	1.61	6.0
South McAlester	.....	.....	.....	3.60	0.5
Tahlequah	67	13	40.0	2.10	4.7
Tulsa	.....	.....	.....	1.93	.....
Wagoner	69	13	40.3	2.15	4.0
Webbers Falls	.....	.....	.....	3.05	3.0
Iowa.					
Afton	49	— 4	23.0	1.31	5.0
Albia	62	— 9	25.6	1.90	2.5
Algona *1	50	—10	20.4	0.20	2.0
Alta *a*	52	—12	20.1	1.06	2.1
Amana	50	— 5	24.0	1.64	2.5
Ames *b*	49	— 8	21.1	2.35	12.2
Ames (near)	.....	.....	.....	2.17	7.2
Atlantic	50	— 3	22.6	1.58	2.5
Audubon	55	— 4	23.8	1.10	4.0
Bancroft	53	— 9	20.8	0.70	T.
Batavia	.....	.....	.....	0.97	0.4
Baxter	50	— 9	21.0	1.60	3.0
Belknap	75	— 5	27.0	1.85	5.5
Bellplaine	50	— 9	23.4	2.31	3.8
Bonaparte	53	— 4	26.7	0.89	4.0
Britt	44	— 9	19.3	0.84	1.6
Buckingham	.....	.....	.....	1.23	10.0
Burlington	60	— 4	30.8	1.76	2.1
Bussey	.....	.....	.....	2.56	2.0
Carroll	56	—10	21.9	1.48	6.0
Carson	.....	.....	.....	1.79	2.0
Cedar Rapids	52	— 4	24.4	1.27	1.5
Chariton	53	— 6	25.6	2.22	3.0
Charles City	46	—11	19.8	1.84	10.0
Chillicothe	.....	.....	.....	1.65	0.5
Clarinda	53	— 1	24.3	1.87	4.8
Clearlake	45	—10	19.5	0.10	1.0
Clinton	51	— 4	24.2	2.32	2.0
College Springs	50	— 1	25.2	1.38	4.2
Coon Rapids	49	— 9	23.6	1.19	1.5
Corning	49	— 5[f]	22.6[i]	2.29	8.2
Council Bluffs	54	0	24.9	1.37	0.5
Cresco	43	—15	16.8	1.49	9.4
Cumberland	.....	.....	.....	1.43	4.0
Danville	.....	.....	.....	1.30	4.0
Decorah	45	—13	18.8	2.06	12.5
Delaware	47	—11	20.4	2.14	7.2
Denison	52	— 9	21.6	0.92	4.0
Desoto	49	— 5	22.8	3.15	10.0
Dows	48	—11	20.6	1.09	2.0
Eldon	56	— 6	26.7	2.52	5.9
Elkader	51	—10	22.0	2.20	4.0
Emerson	.....	.....	.....	2.25	2.5
Emmetsburg	.....	.....	.....	0.92	.....
Fairfield	52	— 4	26.0	1.88	3.0
Fayette	46	—11	19.3	1 84	5.6
Fonda	54	—14	18.4	2.53	12.5
Forest City	51	— 9	19.1	0.72	1.5
Fort Madison	.....	.....	.....	1.91	1.5
Galva	54	— 9	20.8	0.96	.....
Gilman	.....	.....	.....	1.73	T.
Gladbrook	.....	.....	.....	1.17	3.0
Glenwood	55	— 1	26.0	0.92	1.2
Grand Meadow *1	46	—10	19.6	2.13	7.0
Greene	49	—11	20.4	1.73	18.0
Greenfield	50	— 6	22.4	1.47	6.3
Grinnell	46	— 6	23.4	1.57	T.
Grinnell (near)	47	— 8	22.6	.....	.....
Grundy Center	47	—11	19.3	1.66	6.0
Guthrie Center	49[b]	— 4	22.0[i]	2.50	11.0
Hamburg	.....	.....	.....	0.95	3.5
Hampton	51	— 8	20.6	1.73	13.2
Harlan	49	— 5	22.4	1.43	2.6
Hawkeye	.....	.....	.....	3.80	18.0
Hedrick	55	— 6	25.0	1.34	2.5
Hopeville	50	— 4	23.5	1.68	.....
Humboldt	52	—10	21.2	0.73	T.
Independence	47	— 8	20.0	1.67	3.5
Indianola	51	—16	22.8	1.93	.....
Iowa City	53	— 5	23.8	1.93	4.0
Iowa Falls	48	— 9	19.2	1.64	9.0
Keosauqua	54	— 3	27.2	1.67	4.5
Knoxville	53	— 5	25.2	3.00	2.0
Lacona	.....	.....	.....	2.01	7.5
Lamoni	51	— 5	24.6	2.07	2.3
Lansing	51	—12	21.8	2.65	13.6
Larchwood	51	—14	19.8	0.98	3.0
Larrabee	56	—15	20.0	0.43	2.7
Leclaire	.....	.....	.....	2.11	T.
Lemars	56	— 9	22.2	1.06	3.0
Lenox	49	— 5	23.0	1.83	5.9
Logan	50	— 5	23.6	1.51	2.0
Maple Valley	.....	.....	.....	1.33	3.0
Maquoketa	55	— 5	25.4	1.82	0.5
Marshalltown	48	— 9	22.6	2.17	5.5
Mason City	65	—10	22.2	.....	.....
Monticello	62	—10	24.6	4.28	6.5
Mooar	56	— 2	27.4	1.27	.....
Mountayr	50	— 4	23.6	1.25	6.0
Mount Pleasant	57	— 7	25.1	1.89	.....
Mount Vernon *a* *1	50	— 9	22.7	2.17	.....
Mount Vernon *b*	49	— 6	23.4	2.55	6.4
Murray	.....	.....	.....	1.83	3.0
New Hampton	44	—12	18.8	0.29	1.2
Newton	47	—10	21.2	2.34	6.5
Northboro	.....	.....	.....	0.42	4.2
North McGregor	.....	.....	.....	2.21	10.0
Northwood	54	— 8	20.2	0.76	.....
Odebolt	52	— 9	23.0	1.00	2.0
Ogden	54	—14	21.8	1.65	12.0
Olin	49	— 6	22.4	2.24	4.5
Onawa	58	— 5	24.8	1.37	2.0
Osage	45	—11	19.2	1.91	14.0
Osceola	53	— 5	23.6	1.35	3.2
Oskaloosa	50	— 5	24.1	1.91	1.5
Ottumwa	54	— 3	27.8	1.57	1.0
Ovid	54	— 8	24.8	1.87	4.2
Pacific Junction	61	— 3	24.4	1.73	1.5
Pella	55	—10	21.4	1.10	2.0
Plover	54	—13	21.8	1.20	1.0
Primghar	66	—17	22.4	0.70	T.
Redoak	64	2	27.8	2.15	3.0
Ridgeway	46	—10	22.3	4.21	18.5
Rockwell City	50	—12	22.0	1.59	7.0
Ruthven	52	—19	18.4	1.89	0.2
Sac City	52	—11	21.9	1.50	3.0

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Scranton	46	— 7	22.8	2.00	4.0
Sheldon	57	—13	19.0	1.15	3.2
Sibley	55	—18	19.2	1.29	4.3
Sigourney [*]	53	— 7	27.8	.....	.....
Sioux Center	53	—10	20.4	1.44	1.3
Spirit Lake	54	—12	21.4	1.06	0.5
Storm Lake	52	—11	21.6	1.06	2.5
Stuart	50	— 8	21.7	1.94	7.5
Thurman	51	1	24.8	2.59	.....
Villisca	60	— 4	23.2	2.44	.....
Vinton [*1]	48	— 6	23.1	0.28	T.
Wapello	63	— 3	28.1	2.48	3.5
Washington	52	— 8	24.0	2.09	5.0
Washta	.....	.....	.....	1.10	1.0
Waterloo	50	— 9	21.6	1.80	2.5
Waverly	46	— 8	20.7	1.97	10.0
Westbend [*1]	53	— 8	19.7	1.12	2.0
Westbranch	60	— 5	25.8	1.94	2.0
West Union	.....	.....	.....	0.60	6.0
Whitten	46	—12	19.5	1.61	8.0
Wilton Junction	52	— 5	24.8	2.55	2.0
Winterset	59	— 5	23.0	2.00	7.0
Woodburn	.....	.....	.....	1.87	7.2
Kansas.					
Abilene	60	3	29.8	1.21	1.0
Achilles	.....	.....	.....	0.21	1.6
Altoona [*2]	59	—10	29.2	1.39	7.0
Anthony	.....	.....	.....	0.75	4.0
Atchison *a*	59	4	28.6	1.19	4.8
Atchison *b*	62	5	32.8	1.42	4.8
Augusta	67	— 7	32.8	2.11	4.0
Beloit	59	7	30.1	1.07	0.2
Burlington	66	— 7	31.3	1.81	6.2
Campbell	57	3	27.8	1.51	4.6
Centropolis [*1]	60	2	29.5	2.47	6.2
Chanute	70	— 6	36.5	3.95	8.5
Colby	64	— 6	30.1	0.35	2.8
Columbus	66	— 1	32.9	1.85	6.8
Coolidge	60	—12	27.6	0.90	9.0
Cunningham	65	— 6	32.4	0.97	7.0
Delphos	62	5	31.6	1.39	1.3
Dresden	62	— 1	28.1	0.42	1.5
Ellinwood	64	— 1	32.3	0.53	2.0
Emporia	73	— 3	31.3	.....	.....
Englewood	71	— 6	35.0	0.62	3.2
Eskridge	58	8	30.8	1.10	3.5
Eureka Ranch	64	— 7	30.6	0.65	2.0
Fallriver	70	— 9	33.8	1.35	5.0
Fanning	56	— 7	28.4	1.26	3.5
Fort Riley	60	2	30.5	1.27	1.0
Frankfort	60	— 2	28.6	1.57	2.8
Garden City	65	—11	31.0	0.78	7.0
Garfield	.....	.....	.....	0.37	3.0
Gibson	66	— 3	30.2	0.81	5.0
Gove [*1]	69	— 2	29.6	0.44	2.2
Grenola	69	— 4	32.6	2.13	4.0
Halstead	.....	.....	.....	1.44	.....
Hays	64	10	34.2	0.65	1.5
Horton	54	4	28.2	1.40	3.0
Hutchinson	74	3	35.8	1.32	7.0
Independence	65	2	34.0	1.51	3.0
Lakin	64	— 8	30.2	0.80	8.0
Lawrence	62	2	29.8	1.28	5.0
Lebanon	.....	.....	.....	0.95	0.5
Lebo	63	— 2	30.2	1.85	7.8
Macksville	66	— 3	32.2	0.66	.....
McPherson	62	3	31.6	2.13	.....
Manhattan *b*	59	6	29.7	1.13	2.0
Manhattan *c*	62	6	30.5	1.07	0.5
Marion	59	— 1	32.4	1.55	8.0
Meade	.....	.....	.....	0.40	4.0
Medicine Lodge	67	— 2	33.8	1.29	4.0
Minneapolis	60	4	30.4	1.54	5.5
Morantown	63	2	31.6	1.88	6.4
Mounthope [*1]	55	3	32.4	1.52	7.0
Ness City	60	— 2	32.8	0.60	3.0
Norwich	73	4	35.0	0.76	4.2
Oberlin	.....	.....	.....	0.25	1.0
Olathe	63	— 2	30.1	1.81	6.5
Osage City	61	— 6	31.3	1.72	5.2
Oswego	69	— 2	35.2	1.63	4.0
Ottawa	61	— 6	30.7	1.57	6.8
Phillipsburg	68	6	31.4	0.99	1.0
Pratt	65	— 1	33.4	0.59	.....
Rome [*1]	64	5	34.9	1.91	8.0
Russell	.....	.....	.....	0.43	.....
Salina	60	3	30.3	0.99	5.0
Sedan	66	— 1	33.3	1.80	7.0
Seneca	58	0	27.8	1.17	5.5
Toronto	65	10	33.2	2.63	7.0
Tribune	65[c]	— 2	28.8[d]	0.50	5.0
Valley Falls	57	3	29.1	1.05	2.3
Viroqua	61	— 4	32.6	0.90	9.0
Wakeeney (near)	.....	.....	.....	0.38	2.5
Wallace	.....	.....	.....	0.40	3.0
Wamego [*1]	59	9	28.6	0.98	0.6
Kansas—Cont'd.					
Winfield	65	— 1	33.4	2.65	10.0
Winona	.....	.....	.....	0.15	1.5
Yates Center	69	— 9	30.8	1.10	6.0
Kentucky.					
Alpha	.....	.....	.....	5.78	1.2
Bardstown	64	0	35.2	5.28	3.0
Blandville	61	5	34.4	4.77	2.0
Bowling Green	64	3	36.6	4.86	3.2
Burnside	.....	.....	.....	4.08	3.2
Canton [*1]	61	10	36.9	2.43	2.3
Carrollton	65	3	32.2	3.44	1.5
Catlettsburg	70	.....	.....	3.11	3.0
Earlington	61	3	35.9	4.66	3.5
Edmonton	66	— 2	37.5	5.44	4.1
Eubank	61	—15	33.6	4.30	4.5
Falmouth	.....	.....	.....	3.69	2.6
Fords Ferry	65	3	34.8	4.34	1.0
Frankfort	67	3	36.0	4.12	.....
Georgetown	62	— 4	32.9	.....	.....
Greensburg	62	— 8	33.7	4.88	2.5
Henderson	62	6	33.7	3.79	1.5
Hopkinsville	60	3	32.6	3.48	3.0
Irvington	63	0	34.2	3.76	1.2
Jackson	70	— 5	36.8	2.98	5.0
Leitchfield	63	— 4	33.8	4.74	3.0
Loretto	69	— 6	33.6	5.06	1.3
Marrowbone	62	— 7	35.2	4.93	2.0
Maysville	66	— 4	33.2	4.39	4.0
Mount Hermon	67	2	35.5	6.22	2.0
Mount Sterling	63	— 3	32.8	4.59	5.5
Owensboro	62	3	36.5	4.47	0.7
Owenton	61	— 4	32.8	5.17	4.0
Paducah *a*	.....	.....	.....	5.11	3.0
Paducah *b*	63	10	36.8	4.75	3.8
Princeton	60	6	34.0	3.89	2.0
Richmond	65	0	34.0	4.60	3.6
St. John	63	— 3	34.2	4.77	0.7
Scott	61	— 2	32.2	3.28	1.0
Shelby City	61	— 8	32.8	3.94	4.0
Shelbyville	63	1	34.4	4.71	2.5
Vanceburg	66	— 5	35.2	.....	.....
Warfield	70	—13	36.2	2.74	0.8
Williamsburg	65	0	37.5	3.25	3.0
Louisiana.					
Abbeville	76	30	53.0	4.40	
Alexandria	79	23	50.0	9.21	
Amite	80	25	53.2	3.79	
Bastrop	74	21	47.4	4.26	2.5
Baton Rouge	78	27	51.8	3.88	
Calhoun	71	21	44.7	5.10	
Clinton	79	26	50.6	5.55	
Como	75	21	46.9	7.54	
Donaldsonville	78	28	49.9	4.55	
Emilie	77	31	52.6	3.91	
Farmerville	73	21	44.4	4.55	T
Franklin	76	32	53.0	7.21	
Grand Coteau	76	28	51.9	9.87	
Hammond	80	25	53.4	3.70	T.
Houma [7]	81	31	55.0	4.38	
Jeanerette	79	30	51.9	7.55	
Jennings	79	27	51.8	8.88	
Lafayette	79	28	52.5	7.84	
Lake Charles	78	30	53.4	6.10	
Lake Providence	82	21	47.6	4.05	3.0
L'Argent	.....	.....	.....	9.27	
Lawrence	79	36	54.9	3.34	
Libertyhill	79	23	47.6	5.22	0.5
Mansfield	78	20	46.6	5.52	
Melville	77	23	50.6	8.70	
Minden	74	21	47.1	3.50	T.
Monroe	74	23	47.6	3.94	0.1
Montgomery	.....	22	.....	6.27	T.
New Iberia	74	28	52.2	7.50	
Oakridge	85	20	47.1	6.86	1.0
Opelousas	.....	23	.....	6.94	
Oxford	74	21	47.5	4.87	
Paincourtville	79	29	53 3	4.42	
Plain Dealing	72	20	45.7	4.08	0.4
Plaquemine	78	30	54.2	2.85	
Prevost	80	28	53.8	3.06	
Rayne	78	28	51.8	10.87	
Ruston	73	22	46.9	4.65	T.
Schriever	82	28	53.8	4.44	
Southern University	87	31	52.6	3.55	
Sugar Ex. Station	76	30	52.2	4.00	
Sugartown	74	29	50.8	3.16	
Venice	78	40	58.9	5.43	
Wallace	80	32	54.4	4.62	
White Sulphur Springs	75	25	53.0	9.40	
Maine.					
Bar Harbor	56	— 4	29.4	2.57	4.5
Belfast [*6]	53	— 1	29.6	2.90	6.0
Calais	55	— 5	25.8	3.48	12.0
Cornish [*1]	53	0	27.6	1.79	3.8
Fairfield	57	— 1	27.8	1.93	2.5
Farmington	53	— 5	25.0	2.71	8.2
Maine—Cont'd.					
Flagstaff	50[e]	—17[e]	23.9[e]	2.15	8.0
Gardiner	57	3	29.3	2.61	7.1
Lewiston	54	0	29.0	2.03	3.2
Mayfield	51	— 4	23.4	3.05	17.0
Orono	57	— 9	28.0	3.09	6.5
Petit Menan [*1]	42	9	25.5	.....	.....
Rumford Falls	54	— 7	24.0	1.95	10.5
Winslow	59	— 2	29.4	1.90	3.5
Maryland.					
Annapolis	65	8	38.2	1.60	2.0
Bachmans Valley	63	0	31.8	2.80	1.0
Boettcherville	64	5	33.4	2.18	1.5
Boonsboro *a*	66	3	34.6	1.96	T.
Cambridge	68[e]	15[e]	39.9[e]	1.73	0.3
Chase	67	0	32.6	1.15	1.0
Chestertown	67	9	37.2	1.28	1.5
Chewsville	65	3	34.1	2.26	.....
Clearspring	65	4	32.1	2.35	0.2
Coleman	65	.....	.....	1.10	1.5
Collegepark	64	— 5	34.4	1.62	1.2
Cumberland	69	8	37.4	2.09	1.1
Darlington	64	5	34.7	1.59	0.8
Deerpark	58	— 3	27.8	2.73	13.0
Easton	65	8	36.6	1.42	2.0
Ellicott City	66	2	34.6	1.59	3.0
Fallston	62	4	34.9	1.70	1.0
Frederick	65	5	36.0	2.20	0.8
Frostburg	59	.....	.....	2.88	7.5
Grantsville	59	— 3	28.5	2.85	13.5
Greenspring Furnace	63	6	33.4	2.15	0.2
Hagerstown	65	5	34.8	.....	.....
Hancock	61	5	33.6	2.24	.....
Jewell	65	1	37.8	1.62	1.5
Johns Hopkins Hospital	67	7	35.1	1.40	1.0
Laurel	67	5	35.8	1.72	1.0
Mardela Springs	.....	.....	.....	0.83	3.0
Mount St. Marys Coll	64[d]	1[d]	33.8[d]	2.05	0.5
Newmarket	64	2	34.4	1.98	0.8
Pocomoke	68	8	42.0	0.80	3.0
Princess Anne	67	— 3	37.8	1.39	3.0
Queenstown	65	7	36.2	1.43	3.5
Rockhall *b*	66	11	37.9	1.03	0.7
Sandy Point	62	10	41.3	1.30	2.0
Sharpsburg	65	6	34.7	2.05	0.5
Smithsburg *b*	63	3	34.7	2.46	1.8
Solomons	65	10	40.8	1.48	3.2
Sudlersville	68	8	39.0	1.59	1.0
Sunnyside	56	— 6	26.0	4.63	20.2
Taneytown	65	4	34.0	2.43	0.5
Van Bibber	63	5	33.8	1.85	1.9
Westernport	58	6	30.6	1.73	2.6
Westminster	61	3	32.2	.....	.....
Woodstock	66	5	33.6	1.51	2.1
Massachusetts.					
Adams	60	2	31.4	.....	.....
Amherst	62	2	31.0	2.20	T.
Attleboro	.....	.....	.....	2.21	T.
Bedford	62	0	31.7	0.99	T.
Bluehill (summit)	62	1	32.7	1.89	T.
Cambridge	66	4	34.6	1.51	.....
Chestnuthill	65	2	33.8	1.75	.....
Cohasset	.....	.....	.....	1.41	.....
Concord	64	1	31.4	1.72	T.
Dudley [*1]	60	— 3	31.5	1.75	T.
East Templeton [*1]	55	0	28.5	1.70	0.2
Fallriver	58	6	35.2	1.43	T.
Fitchburg *a* [*1]	58	2	30.3	2.08	0.2
Fitchburg *b*	63	1	30.7	1.76	0.8
Framingham	63	1	34.5	1.71	.....
Groton	63	1	30.2	1.80	0.5
Hyannis [*1]	55	4	34.9	1.27	3.2
Jefferson	.....	.....	.....	2.12	1.0
Lawrence	63	2	32.2	1.51	T.
Leeds	60	— 4	29.7	2.65	T.
Leicester	60	— 1	29.3	1.32	T.
Leominster	.....	.....	.....	1.61	0.2
Lowell *a*	63	3	32.0	1.68	.....
Lowell *b*	64	2	32.0	.....	.....
Ludlow Center	64	0	28.0	1.96	.....
Middleboro	63	1	32.8	1.33	T.
Monson	62	— 1	31.4	2.52	.....
New Bedford *a*	58	9	35.8	1.99	1.0
New Salem	58	— 4	28.8	2.30	1.4
Pittsfield	57	0	28.9	2.60	1.2
Plymouth [*1]	61	0	31.8	1.86	0.5
Princeton	.....	.....	.....	2.21	1.5
Provincetown	68	8	38.0	0.93	T.
Salem	.....	.....	.....	1.52	.....
Somerset [*1]	66	0	34.8	0.88	T.
South Clinton	.....	.....	.....	2.10	T.
Springfield Armory	64	5	32.6	1.67	0.5
Sterling	.....	.....	.....	1.70	0.5
Taunton *c*	62	— 4	32.6	1.47	T.
Webster	.....	.....	.....	1.77	.....
Westboro	65	2	33.0	1.49	0.0

TABLE II.—*Climatological record of voluntary and other cooperating observers.*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Massachusetts—Cont'd.	°	°	°	*Ins.*	*Ins.*
Weston	63	5	33.4	1.51	T.
Williamstown [1]	59	2	28.7	2.29	0.8
Winchendon	...	.....	.....	2.00	0.5
Worcester [b]	63	2	32.6	1.69	T.
Michigan.					
Adrian	59	— 5	26.6	2.39	6.0
Agricultural College	56	— 7	25.0	1.51	3.6
Allegan [b]	64	5	31.4	1.85	8.5
Alma	57	— 6	26.3	1.76	5.2
Ann Arbor	58	— 7	26.7	2.07	5.5
Arbela	62	—10	28.4	2.23	1.0
Baldwin	55	.....	.....	2.45	10.0
Ball Mountain	56	— 3	27.2	3.02	4.4
Battlecreek	57	— 3	27.6	2.50	9.4
Bay City	57	— 7	26.6	1.95	2.7
Berlin	54	— 6	25.2	1.69	7.4
Berrien Springs	50	0	29.0	5.35	39.0
Big Rapids	55	—15	25.2	3.21	3.5
Birmingham	55	— 3	26.0	2.56	3.2
Boon	55	—21	23.2	4.06	18.0
Calumet	46	— 5	20.1	4.85	42.5
Carsonville	51	— 3	26.8	0.55	4.5
Charlevoix	51	4	29.0	2.65	9.0
Cheboygan	52	— 7	24.3	3.32	7.5
Clinton	59	— 7	28.1	2.07	4.8
Coldwater	57	— 4	27.4	4.23	17.5
Eagle Harbor	48	— 1	24.4	5.28	.....
East Tawas	48	— 8	25.4	0.70	.....
Eloise	57	— 5	27.7	2.27	3.2
Ewen	.....	.....	.....	2.14	22.2
Fairview	57	— 7	26.8	1.62	8.9
Fitchburg	56	—10	26.4	1.89	9.5
Flint	.....	— 1	.....	1.16	2.0
Frankfort	50	7	28.3	2.86	15.5
Gladwin	56	—12	25.8	2.75	6.5
Grand Rapids	60	2	29.6	3.04	7.2
Grape	60	— 6	28.0	2.46	5.5
Grayling	54	—21	24.0	1.28	10.3
Hanover	57	— 8	27.1	1.94	12.0
Harbor Beach	54	1	27.4	2.16	5.8
Harrisville	47	—10	24.0	1.84	3.6
Hart	57	6	28.4	2.36	9.0
Hastings	58	— 9	27.1	1.96	7.9
Hayes	51	— 2	27.9	1.11	2.5
Highland Station	.....	.....	.....	2.27	7.0
Hillsdale	58	— 4	26.9	2.77	12.5
Holland [9]	57	8	31.6	.....	.....
Howell	58	— 7	27.2	0.78	T.
Humboldt	42	—11	16.3	1.28	5.0
Ionia	57	— 5	27.4	1.70	6.0
Iron Mountain	50	—12	19.6	1.57	12.6
Iron River	52	—26	18.6	1.95	14.5
Ishpeming	41	—12	18.6	2.65	21.8
Ivan	54	—16	23.1	2.96	21.5
Jackson	58	— 5	27.4	1.69	6.5
Jeddo	55	— 4	25.2	2.45	7.6
Kalamazoo	57	0	27.8	3.27	13.8
Lake City	55	—19	24.2	1.65	6.5
Lansing	58	— 4	26.6	1.61	5.0
Lapeer	57	9	29.5	.....	.....
Lathrop	46	—10	20.2	1.65	13.0
Lincoln	53	—10	24.5	1.70	3.5
Ludington	55	3	29.2	3.19	6.3
Luzerne	54	—18	22.7	1.87	4.5
Mackinaw	47	— 9	25.2	3.35	6.0
Madison	58	— 5	27.4	2.26	6.2
Mancelona	55	—18	22.2	3.58	34.0
Manistique	44	— 6	24.4	1.99	4.7
Menominee	43	— 6	23.4	0.26	T.
Middle Island [10]	46	— 2	26.5	.....	.....
Mottville	58	— 2	27.0	2.66	18.1
Mount Clemens	54	— 3	27.0	1.75	T.
Mount Pleasant	57[f]	— 7[f]	29.0[f]	2.16	0.8
Muskegon	57	3	29.6	3.50	7.0
Newberry	43	—12	20.3	0.85	9.0
North Manitou Island [10]	60	— 6	27.4	.....	.....
Northport	54	4	28.0	2.82	19.5
Old Mission	52	— 2	27.0	3.77	16.0
Olivet	57	— 5[e]	27.4	1.33	9.0
Omer	52	— 8	24.0	0.80	.....
Ovid	58	— 4	27.0	1.28	2.5
Owosso	58	— 8	26.8	1.79	5.0
Petoskey	50	— 8	26.2	3.36	10.5
Plymouth	62	.....	.....	3.12	3.0
Port Austin	55	2	27.6	1.17	3.5
Reed City	64	—16	29.0	1.86	3.8
Rogers	55	— 6	25.8	2.80	10.7
Romeo	54	— 5	30.2	2.68	5.0
Saginaw	57	— 5	27.8	1.50	2.2
St. Ignace	48	—14	21.2	3.17	3.0
St. Johns	57	— 3	28.4	1.46	2.3
St. Joseph	59	8	31.4	3.81	14.0
Somerset	57	— 5	26.4	1.69	8.0
South Haven	58	— 7	30.4	4.68	29.9
Stanton	58	10	27.7	.....	.....
Thomaston	.....	.....	.....	4.10	41.0
Thornville	55	— 6	27.2	2.13	9.5
Traverse City	50	— 4	27.4	4.52	23.9
Vandalia	57	— 2	28.0	5.39	32.8
Vassar	57	5	27.0	1.09	0.2
Wasepi	58	— 3	27.0	2.71	13.5
Waverly	58	3	29.0	3.10	12.3
Wetmore	48	— 9	19.4	2.46	23.0
Whitecloud	57	— 8	27.2	1.61	4.5
Ypsilanti	59	— 7	27.7	2.85	7.5
Minnesota.					
Ada	42	—17	11.8	0.48	6.0
Albert Lea	47	— 9	21.4	0.85	3.0
Alexandria	46	—11	17.6	0.40	4.0
Ashby	45	—11	17.6	0.17	1.6
Beardsley	51	—15	17.2	0.10	0.9
Bird Island	50	—11	19.3	1.62	4.0
Blooming Prairie	46	—11	18.7	0.70	1.5
Brainerd	49	—12	16.5	1.14	4.0
Caledonia	46	—19	17.8	4.05	20.0
Camden	48	— 6	21.8	0.33	0.8
Collegeville	48	— 8	22.2	0.54	2.1
Crookston	41	—16	13.5	0.33	3.4
Currie	52	—11	18.6	0.40	....
Deephaven	.....	.....	.....	1.15	.....
Detroit City	42	—18	11.2	0.65	6.5
Faribault	49	—11	20.6	0.65	T.
Farmington	49	—15	18.6	1.13	2.3
Fergus Falls	45	—14	15.0	0.20	2.0
Glencoe	50	—12	19.4	.....	.....
Grand Meadow	45	—12	16.0	0.98	8.0
Hallock	41	—22	9.6	0.23	2.3
Lake City	47	— 9	21.0	1.22	3.5
Lake Jennie	63	—10	19.5	1.10	T.
Lakeside	50	—12	16.6	1.34	.....
Lake Winnibigoshish [1]	47	—17	14.9	0.63	5.8
Leech	48	—20	13.8	0.42	4.4
Leroy	49	—12	20.1	1.95	13.0
Long Prairie	45	—11	16.2	0.83	2.8
Luverne	47	—14	18.7	1.49	7.4
Lynd	61	—21	20.7	0.42	3.0
Mapleplain [1]	50	—12	19.2	1.18	2.4
Milan	53	—16	18.2	0.35	1.0
Minneapolis [a]	49	—12	18.5	1.44	1.3
Minneapolis [b] [1]	50[e]	—12	19.7	1.44	0.9
Minnesota City [1]	48	—11	20.9	1.38	12.5
Montevideo	52	—15	17.1	0.75	1.5
Morris	48	—12	17.9	0.20	T.
Mount Iron	43	—20	13.2	1.40	6.0
Newfolden	42	—21	10.2	0.24	2.4
New London	46	—11	16.6	0.46	T.
New Richland [1]	48	—16	19.9	.....	....
New Ulm	50	— 9	20.2	1.02	1.2
Park Rapids	42	—16	13.3	0.31	3.1
Pine River	45	—13	15.8	0.94	6.3
Pipestone	46	—18	17.6	0.44	1.7
Pleasant Mounds	54[d]	— 8[d]	20.8[d]	0.78	0.2
Pokegama Falls	49	—25	12.8	0.65	4.7
Redwing	.....	.....	.....	1.12	2.0
Reeds	.....	.....	.....	1.57	3.1
Rolling Green	51	—10	20.0	0.80	0.5
St. Charles	48	—14	18.4	2.29	17.0
St. Cloud	52	—10	18.7	0.36	T.
St. Peter	49	— 6	22.2	1.05	0.5
Sandy Lake Dam	47	—18	15.2	0.58	3.5
Shakopee	50	—10	20.6	1.03	1.2
Tower	46	—18	16.0	1.15	7.5
Two Harbors	.....	—15	.....	1.77	7.0
Wabasha [1]	45	— 8	20.0	1.65	9.0
Willmar	48	—10	17.8	1.30	T.
Willow River	49[c]	—16	17.4[d]	0.94	1.2
Winnebago City	56	— 6	20.8	1.01	T.
Worthington	55[c]	—12[c]	21.1[c]	1.03	1.5
Zumbrota [1]	48	—14	20.5	....	.....
Mississippi.					
Aberdeen	65	18	39.8	6.70	3.0
Americus	79	28	52.3	4.67	
Austin	69	15	41.9	5.40	1.0
Batesville	63	15	38.2	7.04	1.0
Bay St. Louis	71	31	51.4	3.98	T.
Biloxi	75	30	52.1	3.50	
Booneville	65	16	41.2	5.89	
Brookhaven	78	21	48.3	4.75	
Canton	76	21	47.2	8.55	1.0
Columbus [a]	.....	.....	.....	8.40	0.8
Columbus [b]	71	21	43.8	6.71	
Crystalsprings	77	23	47.1	7.96	T.
Edwards	72	25	47.4	10.70	3.0
Fayette	75	24	49.1	9.95	T.
Greenville [a]	66	22	43.0	4.22	2.5
Greenville [b]	77	21	45.0	4.23	2.5
Greenwood [1]	69	26	46.0	7.76	3.0
Hattiesburg	74	27	48.4	6.52	
Hernando	72	20	40.2	.....	
Holly Springs	69	17	40.8	6.51	T.
Jackson	72	25	47.6	4.98	2.5
Kosciusko	70	19	45.4	7.70	4.0
Lake	70	19	50.0	4.04	
Leakesville	78	23	49.3	4.63	
Logtown	75	29	51.9	3.34	
Louisville	67	13	44.7	8.69	4.0
Macon	68	20	44.6	4.26	2.0
Magnolia	76	23	49.8	3.94	
Natchez	78	26	49.8	9.70	
Okolona	77	20	45.6	.....	
Palo Alto	66	20	43.9	6.82	2.5
Pontotoc	65	17	42.0	5.11	1.0
Port Gibson	77	21	48.3	11.42	
Ripley	66	13	40.6	6.50	
Stonington [1]	78	26	47.8	.....	
Thornton	.....	.....	.....	6.00	2.0
Tupelo	.....	.....	.....	3.72	
University	64°	16°	41.3°	4.82	1.0
Watervalley [1]	64	17	42.4	7.41	2.0
Waynesboro	73	24	49.6	3.45	T.
Windham	77	22	47.5	5.76	T.
Woodville	72	25	49.6	11.39	
Yazoo City	77	22	46.4	4.75	0.2
Missouri.					
Appleton City	61	— 8	31.0	1.88	9.8
Arthur [3]	.....	— 9	28.8	1.71	9.0
Avalon	55	— 5	26.6	1.97	10.2
Bethany	56	— 5	26.1	2.41	6.0
Birchtree	68	7	34.6	2.03	1.0
Boonville	.....	.....	.....	1.99	9.4
Brunswick	63	— 2	26.3	2.28	12.5
Carrollton	53	— 1	29.0	2.10	2.5
Conception	58	0	29.0	1.45	2.2
Cook Station	63	—10	31.4	2.10	6.5
Cowgill [5]	53	— 2	27.0	2.07	13.0
Darksville	54	— 2	27.2	1.65	7.5
Downing	.....	.....	.....	1.67	3.0
East Lynne [3]	.....	—10	29.2	2.24	11.5
Edgehill [5]	60	4	30.6	2.61	4.5
Edwards	64	—13	32.2	2.39	12.0
Eightmile [1]	60	— 8	31.0	1.88	10.4
Eldon	65	—10	30.8	2.67	16.0
Elmira	60	.....	.....	1.79	5.8
Fairport	.....	.....	.....	1.68	3.6
Fayette	54	— 5	27.3	2.17	13.6
Fulton	.....	.....	.....	2.34	9.5
Galena	.....	.....	.....	1.83	0.4
Gallatin [1]	54	0	27.8	1.71	6.5
Gayoso	65	9	37.4	4.54	0.2
Glasgow	56	— 4	27.5	2.24	12.0
Gorin	.....	.....	.....	1.62	.....
Halfway	63	— 7	32.9	1.77	7.0
Harrisonville	62	— 9	28.9	1.65	7.6
Hazlehurst	.....	.....	.....	2.45	10.0
Hermann	.....	.....	.....	1.53	1.1
Houston	60	1	33.5	1.11	2.0
Houstonia (near)	.....	.....	.....	2.49	12.8
Irena	.....	.....	.....	1.99	5.0
Ironton	63	2	32.0	2.81	2.5
Jackson [3]	59	8	31.2	3.86	1.0
Jefferson City	70	— 6	34.2	2.28	10.0
Kidder	58	— 3	26.3	1.93	7.1
Lamar	64	— 6	34.2	1.70	9.2
Lamonte	.....	.....	.....	1.50	9.0
Lebanon	68	— 4	32.2	2.48	9.5
Lexington	67	0	30.7	2.05	8.0
Liberty	55	— 5	28.0	1.79	4.8
Louisiana	61	— 5	31.0	1.65	5.5
McCune [1]	65	— 7	28.9	2.26	6.0
Macon	56	— 3	28.5	1.33	6.6
Marblehill	62	3	33.3	2.85	1.8
Marshall	55	— 7	26.0	1.86	7.8
Maryville	52	— 3	24.7	2.47	7.2
Mexico	62	— 3	29.2	1.37	9.6
Miami [5]	54	— 3	27.6	2.21	11.0
Mineralspring	65	2	34.0	1.82	0.2
Montreal	63	—11	31.6	2.71	10.2
Mount Vernon	63	— 2	35.8	2.30	2.5
Neosho	68	2	35.7	1.92	2.0
Nevada	.....	.....	.....	1.69	8.0
New Haven	66	1	30.6	2.27	10.5
New Madrid	61	14	37.6	6.10	1.5
New Palestine	59	— 1	30.4	1.90	6.9
Oakfield	65	1	33.2	2.22	7.6
Olden	57	6	34.0	1.95	1.0
Oregon [a]	60	9	27.7	2.13	5.5
Oregon [b]	56	3	29.4	1.75	4.5
Palmyra [5]	60	0	28.7	1.75	10.0
Phillipsburg [1]	61	0	30.8	2.34	6.4
Pickering [3]	54	0	24.6	2.45	4.2
Potosi	62	—12	27.5	2.30	9.0
Princeton	57	— 2	26.6	1.97	2.5
Rhineland	68	— 7	31.0	2.05	10.4
Richmond	55	0	29.0	2.00	5.5
Rockport	.....	.....	.....	1.50	.....
Rolla	.....	.....	.....	1.81	10.0
St. Charles	61	0	30.7	2.76	14.5
St. Joseph	.....	.....	.....	1.46	4.8

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Missouri—Cont'd.	°	°	°	*Ins.*	*Ins.*
Sarcoxie *3	.....	0	28.9	1.51	3.0
Seymour	56	1	31.4	1.67	0.5
Shelbina	.....	.....	.....	1.80	6.0
Sikeston	65	10	36.2	4.72	1.6
Steffenville	57	— 4	29.2	2.41	11.0
Stellada	60	—10	29.8	2.31	15.0
Sublett	64	— 5	26.3	2.20	8.0
Trenton	52	— 1	27.4	1.80	4.5
Unionville	54	0	25.6	1.60	4.0
Vichy	75	2	33.1	2.55	10.2
Warrensburg	58	— 6	29.6	2.19	11.7
Warrenton	61	— 2	28.8	1.77	12.0
Wheatland	.....	.....	.....	2.92	10.5
Willowsprings	59	5	33.9	0.50	0.2
Wylie	72	7	37.0	2.20	T.
Zeitonia	68	5	35.2	1.96	0.8
Montana.					
Adel	49	—25	25.2	1.08	10.8
Boulder	52	—14	23.4	1.05	6.5
Butte	50	0	27.6	1.10	11.0
Canyon Ferry	55	—10	24.6	0.47	7.2
Chinook	51	—26	19.3	1.47	9.0
Corvallis	50	—10	26.3	0.50	5.0
Crow Agency	60	—12	23.2	0.87	5.5
Dearborn Canyon	51	—24	23.0	0.80	8.0
Deerlodge	50	— 8	24.5	.....	.....
Dell	46	— 4	19.3	0.01	0.1
Ekalaka	55	—14	21.4	0.49	5.0
Fort Benton	57	—18	25.4	1.60	16.0
Fort Keogh	55	—15	21.8	0.36	2.6
Fort Logan	48	—26	20.2	0.82	.....
Glasgow	47	—30	14.7	0.69	.....
Glendive	55	—20	17.8	0.90	9.0
Glenwood	49	—16	25.5	1.23	.....
Greatfalls	56	—16	26.2	0.80	8.0
Harlem	54	—28	20.6	0.47	6.0
Kipp	53	—26	18.5	2.20	20.5
Livingston	55	.....	.....	1.20	12.0
Manhattan	55	—10	23.5	0.51	5.0
Martinsdale	50	—17	25.8	0.80	8.0
Marysville	46	—16	24.5	0.74	13.0
Missoula	51	— 6	28.2	1.23	11.0
Ovando	45	—15	18.6	1.76	18.6
Parrot	55	— 5	26.6	0.36	3.6
Plains	50	4	30.6	0.90	9.0
Poplar	47	—20	14.8	0.40	4.0
Ridge	50	—11	20.4	1.00	10.0
Troy	52	1	30.0	2.57	12.0
Twin Bridges	53	— 7	25.2	.....	.....
Utica	52	—20	30.0	0.88	9.5
Yale	53	—19	25.3	1.30	13.0
Nebraska.					
Agee	.....	.....	.....	0.10	1.0
Albion [k]	57	— 2	24.5	1.06	8.0
Alliance	.....	.....	.....	0.25	2.5
Alma	65	2	28.4	0.73	0.3
Ansley	60	— 9	24.8	0.99	5.5
Arapaho *1	64	4	28.6	0.40	1.5
Arborville *1	54	2	26.0	1.15	2.0
Ashland *a*	60	— 2	25.6	1.74	1.0
Ashland *b* *1	55	5	25.4	1.59	2.4
Ashton	.....	.....	.....	1.16	4.5
Auburn	55	— 2	26.6	2.06	7.0
Aurora *1	52	5	25.8	1.34	.....
Bartley	.....	.....	.....	0.15	0.5
Beatrice	55	0	25.9	1.60	6.5
Beaver	65	3	30.2	0.66	0.3
Bellevue	.....	.....	.....	1.63	2.0
Benedict	.....	.....	.....	1.50	2.5
Benkleman	.....	.....	.....	0.30	3.0
Blair	55	— 5	23.9	1.51	2.2
Bluehill	.....	.....	.....	0.15	2.5
Bradshaw	.....	.....	.....	1.80	4.9
Brokenbow *1	60	— 2	24.9	0.66	4.5
Burwell	.....	.....	.....	0.95	6.5
Callaway	60	— 2	27.5	0.63	5.5
Camp Clarke	60	— 5	26.8	0.15	1.5
Central City	.....	.....	.....	1.35	4.5
Chester	.....	.....	.....	1.36	6.0
Clatonia	58	— 5	25.0	2.25	6.5
Cody	.....	.....	.....	0.50	.....
Columbus	57	0	25.8	1.12	2.0
Creighton	55	— 7	20.8	0.92	.....
Crete	58	6	28.9	1.59	5.5
Culbertson	.....	.....	.....	0.11	0.9
David City	57	1	24.1	1.80	4.5
Dawson	58	0	28.6	1.33	.....
Eden	.....	.....	.....	1.87	4.9
Edgar *a*	.....	.....	.....	0.94	2.0
Elba	.....	.....	.....	1.86	4.5
Ericson *1	.....	.....	.....	1.94	3.5
Ewing	.....	.....	.....	0.58	1.0
Fairbury	61	— 2	26.2	1.56	10.0
Fairmont	62	3	26.6	1.16	0.1
Fort Robinson	61	— 4	26.0	0.69	5.9
Fremont	57	— 6	25.4	1.53	2.0
Geneva	56	3	26.4	1.57	3.9
Genoa	57	2	24.4	1.63	3.4
Gering	57	— 3	27.2	0.13	1.3
Gothenburg	60	2	26.9	0.60	4.0
Grand Island *b*	62	— 1	26.8	1.59	4.2
Grand Island *c*	59	— 2	25.0	1.25	2.5
Greeley	.....	.....	.....	1.28	4.8
Haigler	....	.....	.....	0.50	5.0
Hartington	53	—10	20.3	1.26	4.5
Harvard	58	3	25.0	1.20	2.0
Hastings *1	57	1	24.6	1.02	1.0
Hayes Center	.....	.....	.....	0.11	1.1
Hay Springs	57	— 5	23.8	0.85	8.2
Hebron	59	— 1	27.6	1.41	4.1
Holdrege *1	60	4	30.3	0.95	2.0
Hooper *1	54	— 3	23.5	1.29	0.8
Hubbard	.....	.....	.....	2.00	T.
Imperial	65	— 1	28.4	0.08	1.1
Johnstown	.....	.....	.....	0.25	1.0
Kearney	.....	.....	.....	1.00	2.0
Kennedy	57	—10	23.4	0.88	8.0
Kimball	62	1	28.4	0.30	3.0
Kirkwood *1	57	— 5	19.8	0.15	0.9
Lexington	66	0	27.2	0.95	5.5
Lincoln *d*	54	5	26.9	1.74	4.9
Lodgepole	64	— 4	26.2	0.32	3.2
Loup	.....	.....	.....	1.00	3.0
Lynch	59	— 8	23.8	0.14	1.5
Lyons	.....	.....	.....	1.35	1.5
McCook	.....	.....	.....	0.10	1.0
McCool	.....	.....	.....	1.31	4.5
Madison	56	— 2	24.3	1.21	3.3
Madrid *5	65	— 5	26.8	0.10	1.0
Marquette	.....	.....	.....	1.26	3.5
Merriman	.....	.....	.....	0.10	0.2
Minden *a*	61	3	25.8	1.00	4.8
Minden *b*	.....	.....	.....	0.90	.....
Monroe	.....	.....	.....	1.26	1.3
Nebraska City *b*	.....	.....	.....	1.85	3.5
Nebraska City *c*	53	— 1	25.7	1.41	...
Nemaha *1	58	0	26.7	1.05	2.0
Nesbit	59	— 5	25.7	0.45	4.0
Norfolk *b*	55	— 7	23.2	1.35	3.5
North Loup	57	— 4	24.7	1.52	6.2
Oakdale	56	— 3	22.6	0.74	1.1
Odell	.....	.....	.....	1.45	2.5
O'Neill	56	— 4	23.2	0.15	1.5
Ord	.....	.....	.....	0.56	.....
Osceola	.....	.....	.....	1.34	1.4
Ough	.....	.....	.....	0.10	1.0
Palmer *b* *5	48	0	22.0	1.00	5.0
Palmyra	.....	.....	.....	1.50	4.8
Plattsmouth *b*	.....	.....	.....	1.31	0.9
Pleasanthill	.....	.....	.....	1.57	4.9
Ravenna *a*	60	— 2	25.7	1.14	3.5
Ravenna *b*	.....	.....	.....	0.78	.....
Redcloud *b* *1	56	9	28.2	1.17	1.2
Republican *1	58	6	28.6	0.62	T.
Rulo	.....	.....	.....	1.81	2.5
St. Libory	.....	.....	.....	1.67	5.5
St. Paul	58	— 1	25.7	1.26	1.9
Salem *1	60	2	27.7	1.45	6.0
Santee	57	—11	23.1	0.78	3.8
Sargent	.....	.....	.....	0.86	5.0
Schuyler	.....	.....	.....	1.50	1.5
Seneca *1	60	—10	22.6	0.62	6.2
Seward *1	53	6	24.8	1.31	2.9
Smithfield	.....	.....	.....	0.62	T.
Spragg	.....	.....	.....	0.81	8.0
Stanton *1	57	— 8	21.8	1.07	1.5
State Farm	57	0	26.8	1.29	2.5
Strang	.....	.....	.....	1.60	4.5
Stratton	.....	.....	.....	0.14	1.1
Superior *5	54	6	28.0	1.15	2.0
Syracuse	.....	.....	.....	1.40	2.5
Tablerock	.....	.....	.....	1.72	5.9
Tecumseh *b*	56	1	26.0	1.50	2.0
Tecumseh *c*	.....	.....	.....	1.67	3.2
Tekamah	57	— 7	25.4	1.74	4.0
Thedford	.....	.....	.....	0.70	7.0
Turlington	54	1	25.2	2.02	5.9
Valentine	58	—20	20.8	0.40	.....
Valparaiso	.....	.....	.....	1.27	1.5
Wakefield	55	— 8	22.9	0.95	1.4
Wallace	.....	.....	.....	0.20	2.0
Weeping Water *1	48	— 3	22.5	2.04	6.5
Westpoint	55	— 7	24.2	1.48	.....
Whitman	.....	.....	.....	0.55	5.5
Wilber *1	58	2	25.4	1.54	5.5
Willard	.....	.....	.....	0.17	2.0
Wilsonville *1	62	— 1	27.5	0.50	1.0
Wisner	.....	.....	.....	0.99	1.8
Wymore *1	46	2	21.6	1.03	2.0
York *1	56	3	25.3	1.55	5.5
Nevada.					
Battle Mountain *1	46	4	24.7	0.75	7.5
Nevada—Cont'd.	°	°	°	*Ins.*	*Ins.*
Beowawe *1	53	—13	21.6	0.90	9.0
Candelaria	66	9	37.0	0.30	3.0
Carson City	66	13	32.8	1.92	7.5
Clover Valley	.....	.....	.....	2.39	12.5
Elko (near)	68	—18	27.9	1.75	17.5
Ely	55	—15	23.3	1.35	13.5
Fenelon	.....	.....	.....	0.60	6.0
Golconda *1	65	10	33.4	0.33	0.5
Halleck *1	57	—17	17.6	1.70	17.0
Hawthorne *b*	65	12	35.2	0.56	2.8
Hot Springs *1	60	0	32.2	0.70	7.0
Humboldt *1	47	10	32.0	0.75	2.5
Lewers Ranch	63	9	32.2	5.46	23.5
Los Vegas	61	22	41.5	0.00	
Lovelocks *1	58	10	31.4	0.64	1.0
McGill	60	—18	24.8	0.75	4.5
Martins	65	15	33.6	1.40	
Mill City *1	56	12	33.2	0.07	0.7
Monitor Mill	54	—10	24.8	1.43	13.5
Palisade *1	58	—12	22.7	1.20	12.0
Palmetto	65	0	31.6	0.60	4.0
Reno State University	60	13	31.5	1.69	.....
Silverpeak	67	5	34.2	0.45	3.0
Sodaville	63	11	33.8	0.20	2.0
Tecoma	.....	.....	.....	0.60	6.0
Toano *1	58	— 9	23.9	0.60	6.0
Tuscarora	50	2	26.4	1.23	11.5
Tybo	51	7	29.8	0.97	14.0
Verdi *1	68	10	34.3	2.05	8.5
Wadsworth *1	66	8	31.4	1.95	10.0
Wells	48	—22	18.6	0.74	.....
Whiterock	56	—16	28.2	1.01	12.2
New Hampshire.					
Alstead	.....	.....	.....	2.58	2.0
Berlin Mills	55	—14	24.4	2.91	12.0
Bethlehem	57	— 8	25.0	1.72	5.5
Brookline *1	60	0	29.6	1.87	0.4
Claremont	60	1	29.2	1.78	1.3
Concord	60	— 2	28.6	1.35	0.6
Durham	63	0	31.3	1.64	.....
Grafton	59	—14	25.1	1.42	2.0
Hanover	60	— 2	27.6	1.85	0.8
Keene	61	— 5	29.0	1.71	0.6
Littleton	57	— 3	25.4	2.46	4.6
Nashua	64	1	30.5	1.35	T.
Newton	65	0	30.8	1.68	T.
North Conway	58	— 9	26.4	3.10	6.5
Peterboro	61	— 4	28.2	1.74	0.6
Plymouth	58	— 6	25.4	1.78	4.0
Sanbornton	58	— 3	26.9	1.43	4.0
Stratford	59	— 8	24.8	2.08	9.0
Warner	.....	.....	.....	1.72	6.0
New Jersey.					
Asbury Park	61	4	37.2	1.68	0.3
Bayonne	63	9	36.2	1.88	0.3
Belvidere	62	.....	.....	2.59	T.
Bergen Point	62	9	36.6	2.73	0.2
Beverly	69	6	36.0	1.73	0.7
Billingsport *1	65	6	35.4	1.76	0.5
Boonton	.....	.....	.....	1.69	.....
Bridgeton	63	8	37.4	1.91	0.5
Camden	66	7	35.9	1.74	0.5
Cape May C. H.	63	11	38.8	1.66	0.4
Charlotteburg	59	4	32.4	4.30	0.5
Chester	58	1	31.2	3.21	2.5
Clayton	67	4	36.0	1.69	0.2
College Farm	64	5	36.1	2.06	T.
Deckertown	61	3	33.4	1.74	T.
Dover	60	4	32.0	3.11	0.5
Egg Harbor City	66	2	35.2	1.88	0.5
Elizabeth	62	7	35.4	2.69	T.
Englewood	64	7	33.8	2.62	1.2
Flemington	65	3	34.2	2.50	4.0
Freehold	65	5	36.4	2.16	1.0
Friesburg	65	6	36.8	1.52	0.7
Hammonton	.....	.....	.....	1.78	1.5
Hanover	61	5	34.5	2.72	T.
Hightstown	64	7	36.0	1.92	T.
Imlaystown	66	5	37.6	1.38	0.4
Lambertville	66	6	34.1	2.17	5.4
Lebanon	.....	.....	.....	2.85	0.8
Moorestown	67	6	35.6	1.82	0.5
Mount Pleasant	.....	.....	.....	1.64	0.2
Newark	61	6	34.4	2.44	0.4
New Brunswick	64	4	36.0	2.09	0.4
Ocean City	59	4	37.3	1.87	1.0
Oceanic	65	5	36.4	2.23	0.1
Paterson	61	8	36.0	2.82	0.5
Perth Amboy	63	6	36.8	1.90	T.
Plainfield	64	4	33.7	2.77	0.2
Rancocas	.....	.....	.....	1.88	0.5
Rivervale	61	2	34.2	2.91	1.0
Rocktown	.....	.....	.....	2.27	T.
Roseland	61	3	32.6	3.20	0.5
Salem	66	8	37.6	1.60	0.5
Somerville	63	3	35.0	2.26	0.2

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
South Orange	60	6	34.5	2.30	T.
Staffordville				1.60	0.1
Toms River	65	0	35.3	1.71	T.
Trenton	66	7	38.6	1.86	T.
Tuckerton	64	5	36.2	1.45	1.0
Vineland	66	1	36.6	1.29	0.5
Woodbine	64	3	37.2	1.85	1.0
New Mexico.					
Albert	68	12	37.9	0.44	2.0
Alma	70	11	37.5	0.41	
Aztec	54	2	29.2	0.43	4.3
Bellranch				1.80	3.0
Bernalillo	63	11	37.0	0.02	T.
Bluewater	60	— 5	30.0	0.35	3.5
Cambray				0.18	
Clayton	64	— 5	30.8		
Deming				T.	T.
East Lasvegas	60	5	34.4	0.09	T.
Engle	67	10	38.6	0.62	6.2
Espanola	59	2	32.4	0.00	
Folsom	57	— 5	31.1	0.94	9.4
Fort Bayard	70	15	40.6	T.	T.
Fort Union	69	5	36.9	T.	T.
Fort Wingate	65	13	36.2	0.25	1.5
Gage				0.11	
Gallinas Spring	63	7	38.0	0.55	4.0
Gila	68	17	41.0	0.56	T.
Hillsboro	72	12	41.7	0.60	6.0
Las Vegas Hotsprings	62	8	36.3		
Lordsburg				T.	T.
Lower Penasco	76	11	39.2	1.05	8.0
Messilla Park	75	16	41.4	0.23	1.2
Raton	68	— 1	35.2	0.36	3.6
Roswell	77	16	40.4	1.54	3.5
San Marcial	66	11	38.3	0.26	2.0
Shattucks Ranch	70	6	38.4	1.55	14.0
Socorro	61	10	36.1	0.32	4.0
Strauss				0.00	
Whiteoaks	59	13	35.2	1.10	9.0
Winsors Ranch	61	— 7	29.9	0.39	
New York.					
Adams				4.05	
Addison	59	— 3	29.2	3.04	10.5
Akron				4.82	
Alfred				4.05	14.8
Angelica	57	—16	28.0	3.97	12.0
Appleton	61	4	31.0	2.70	12.5
Arcade	57	— 7	25.4	4.46	23.9
Atlanta	58	— 8	25.6	3.57	11.4
Auburn	57	0	29.0	3.59	14.0
Avon	61	— 8	28.4	1.92	5.0
Axton	51	—15	22.1	2.48	14.0
Baldwinsville	60	— 1	30.0	3.64	9.0
Bedford *a*	63	5	34.2	2.25	T.
Bedford *b*				2.19	
Big Sandy [10]	57	0	28.6		
Bolivar	64	—20	26.2	4.58	17.5
Bouckville	57	— 9	25.6	3.25	16.0
Boyds Corners				2.75	
Brentwood	60	5	34.6	3.22	0.2
Brockport	60	0	29.8	4.24	16.0
Caldwell	59	— 2	28.6	4.25	8.5
Canajoharie	58	— 2	29.0	2.20	
Canton	60	—23	24.6	4.50	17.0
Carmel	60	6	33.0	2.67	2.0
Carvers Falls	63	0	28.0	2.64	3.0
Catskill	60	4	32.8	2.02	0.5
Cedarhill	60	4	32.2	1.92	2.2
Charlotte [10]	57	8	31.5		
Chenango Forks				1.65	
Cherrycreek				7.27	
Cooperstown	58	— 2	27.9	4.10	4.0
Cortland	57	— 4	28.8	3.98	7.6
Cutchogue	58	10	35.8	1.43	T.
Dekalb Junction				4.77	
Easton				3.81	
Elmira	60	— 4	31.8	1.82	2.0
Fleming	56	0	30.2	2.10	17.0
Fort Niagara	62	2	29.2	2.35	15.8
Franklinville	58	—15	25.4	4.38	24.8
Fulton				4.32	
Garrettsville	57	— 9	28.8		
Glens Falls	60	0	29.0	3.93	5.2
Gloversville	56	— 3	24.8	3.41	8.5
Greenwich	62	— 8	29.6	2.86	4.0
Haskinville				3.19	
Hemlock	59	— 3	29.2	3.77	7.0
Honeymead Brook	59	2	30.4	1.85	0.7
Humphrey	54	— 6	28.0	6.43	31.5
Indian Lake	55	—16	22.4	4.09	24.8
Ithaca	62	— 1	30.0	2.39	4.9
Jamestown	59	3	30.0	6.99	47.0
Jay	60	— 8	26.	2.00	12.0
King Station				3.46	
Liberty	56	— 4	27.8	3.35	3.5
Littlefalls	58	— 8	25.3	3.13	13.0

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New York—Cont'd.	°	°	°	*Ins.*	*Ins.*
Lockport	58	2	29.8	3.11	23.5
Lowville	57	—15	25.4	5.90	16.0
Lyndonville				2.82	
Lyons	64[f]	4	32.4[g]	5.14	17.0
Madison Barracks	61	—19	27.6	6.22	35.8
Mayle				3.38	
Middletown	63	5	31.9	2.22	0.5
Mohonk Lake [1]	53[g]	2	30.3	1.68	
Mount Morris	60	—17	27.8	3.22	16.0
Newark Valley				3.43	
New Lisbon	59	— 4	26.5	3.17	3.2
North Germantown	60	4	32.0	1.64	T.
North Hammond	58	—12	28.6	3.79	22.0
North Lake	53	—25	21.6	6.96	31.5
Number Four	54	—15	23.2	4.29	21.6
Ogdensburg	60	—16	27.8	2.43	9.0
Oneonta				3.53	
Oxford	62	— 3	28.1	3.54	7.5
Palermo	60	— 3	28.2	6.09	35.1
Penn Yan	61	— 2	29.7	2.82	11.4
Perry City	56	— 4	26.8	3.02	14.6
Phœnix				4.71	
Pine City				2.54	
Plattsburg Barracks	59	— 8	27.0	1.29	4.0
Port Byron	60	0	29.6	6.67	24.0
Port Jervis	61	0	30.8	2.01	0.0
Poughkeepsie	66	4	31.7	0.89	0.8
Primrose	61	8	33.6	2.82	0.5
Richmondville	59	— 1	28.4	2.85	1.4
Ridgeway	60	2	29.7	4.21	20.9
Rome	57	—10	26.4	3.93	
Romulus	62	0	31.1	1.75	11.3
Rose				4.36	
St. Johnsville	59	— 3	28.6	3.73	8.4
Salisbury Mills				2.23	
Saranac Lake	54	—13	22.6	2.87	15.2
Saratoga Springs	58	— 2	28.6	3.16	4.0
Schenectady	60	1	31.0	2.18	1.8
Schenevus				3.44	
Setauket	62	10	37.3	1.67	0.5
Sherwood				3.69	
Shortsville	60	— 1	28.7	2.50	10.0
Skaneateles				4.19	
South Canisteo	58	—11	27.0	4.27	25.4
Southeast Reservoir				2.37	
South Kortright	60	— 4	26.8	2.44	
Straits Corners	56	— 7	25.3	3.66	6.5
Ticonderoga	60	0	30.4	2.79	15.0
Volusia	57	1	28.6		
Wappingers Falls	62	5	33.1	1.49	2.0
Warwick				1.42	
Watertown	62	—15	28.0	7.72	87.0
Waverly	62	— 2	30.2	2.48	1.8
Wedgwood	57	— 5	27.6	2.90	11.0
West Berne	50	—10	24.6	2.58	6.0
West Chazy	59	—12	25.3	1.60	16.0
Westfield *a*	62	4	31.3	3.26	22.0
Westfield *b*	59	3	30.0	4.85	
Westfield *c*	62	6	32.9	4.89	30.0
Westpoint	64	7	36.3	2.23	0.6
Willetspoint	65	9	38.0	2.40	T.
Williamson				4.23	
North Carolina.					
Abshers	65	1	36.2	2.62	T.
Asheville				3.01	T.
Biltmore	61	6	35.8	3.17	T.
Bryson City				4.32	5.0
Chapelhill	69	10	40.8	2.24	T.
Cherryville	69	10	42.8	3.55	
Currituck				1.37	1.0
Edenton	69	12	43.5	1.93	3.5
Fairbluff				2.08	
Fayetteville	72	9	43.4	2.76	1.0
Flatrock	60	5	36.0	7.35	T.
Goldsboro	71	9	42.6	2.88	1.0
Greensboro	66	7	39.2	2.34	
Henderson	69	6	40.4	2.93	1.1
Hendersonville	63	6	36.8	7.09	T.
Highlands	57	0	32.4	10.55	T.
Horse Cove	62	4	37.4	7.51	T.
Kinston	72	8	42.5	1.77	1.0
Linville	56	— 5	30.3	7.43	9.0
Littleton	70	6	39.4	2.50	1.0
Louisburg	70	4	40.9	2.32	0.5
Lumberton	69	16	43.8	2.20	
Mana				1.88	T.
Marion	64	5	38.2	5.28	T.
Marshall	63	4	35.6	2.64	2.6
Mocksville	65	16	40.5	2.86	T.
Moncure	69	12	42.0	2.23	
Monroe	68	8	40.4	2.73	T.
Morganton	70	4	45.9	3.60	
Mountairy	63	2	35.8	0.92	0.2
Mount Pleasant	66	9	40.8	2.62	T.
Murphy				4.81	1.0
Newbern	73	12	45.6	2.16	1.5

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
North Carolina—Cont'd.	°	°	°	*Ins.*	*Ins.*
Oakridge	65	2	38.8	2.52	T.
Patterson [11]	59	6	33.6	3.51	T.
Pittsboro	67	3	41.1	1.86	0.5
Rockingham	71[e]	12[e]	40.2[e]	2.89	T.
Roxboro	64[i]	0[e]	37.0[i]	2.49	0.5
Salem	66	2	38.2	2.23	T.
Salisbury	66	6	39.8	2.56	
Saxon	68	0	36.4	1.84	0.5
Selma	71	8	41.9	1.35	T.
Settle	58	1	35.1	1.90	T.
Sloan	72	13	44.7	2.70	T.
Soapstone Mount	67	2	38.6	3.38	T.
Southern Pines *a*	70	10	45.7	2.28	T.
Southern Pines *b*	69	10	41.9	2.32	T.
Southport	75	12	49.2	2.31	1.0
Springhope [11]	67	13	38.4	2.97	T.
Tarboro	74[e]	2[i]	41.8[e]	3.21	2.0
Waynesville	62	4	36.6	3.51	
Weldon *a*	69	8	39.8	2.73	T.
Weldon *b*				2.72	T.
North Dakota.					
Amenia	44[e]	—19[e]	11.8[e]	0.45	4.5
Ashley	48	—21	12.1	0.30	3.0
Berlin	52	—24	13.0	0.35	3.5
Buxton	43	—17	11.6	0.07	
Churchs Ferry	42	—20	11.0	0.25	2.5
Coalharbor	47	—22	12.0	0.80	8.0
Devils Lake	51	—19	12.2	0.20	2.0
Dickinson	50	—14	17.0	0.27	2.7
Dunseith	40	—20	10.4	0.20	2.0
Ellendale	51	—18	16.0	T.	T.
Fargo	46	—19	14.6	0.33	3.3
Forman	49	—16	13.6	T.	T.
Fort Yates				0.09	
Fullerton [1]	49[e]	—19	13.2	0.25	2.5
Gallatin	43	—26	10.2	0.62	6.2
Glenullin	54	—23	14.8	0.63	6.3
Grafton	40	—17	9.2	0.20	2.0
Hamilton	44	—19	10.0	0.41	5.1
Hannaford	44	—21	12.2	0.24	2.4
Larimore	44	—24	11.1	0.40	4.0
McKinney	43	—24	10.2	0.70	7.0
Mayville [k]	50	—12	19.0	0.50	5.0
Medora	50	—18	17.3	0.35	3.5
Melville	45	—18	13.8	0.05	0.5
Milton	38	—20	10.0	0.20	2.0
Minnewaukon	42	—21	9.8	0.22	2.0
Minot	47	—20	15.0	0.04	0.4
Minto	43	—20	10.2	0.08	0.8
Napoleon	49	—22	12.6	0.55	7.0
New England	50	—18	16.1	0.10	1.0
Oakdale	48	—11	17.8	0.35	3.5
Pembina	42	—19	9.6	0.36	3.6
Portal	44	—21	13.8	0.25	2.5
Power	60	—20	15.2	0.20	2.0
St. John	43	—17	10.8	0.20	2.0
Steele	46	—23	13.1	0.67	6.7
Towner	43	—23	10.3	0.30	3.0
University	44	—20	12.8	0.50	5.0
Wahpeton	46	—17	15.6	0.10	1.0
Willow City	44	—22	11.4		
Ohio.					
Akron	62[i]	0[i]	28.6[i]	2.33	12.2
Annapolis	62	— 2	29.4	3.87	2.0
Ashland	61	— 2	27.3	3.10	17.5
Ashtabula	61	3	31.0	7.60	51.0
Atwater				3.02	11.0
Bangorville	61	— 7	28.0	2.98	9.0
Bellefontaine	60	0	29.8	2.23	
Bement				3.68	9.9
Benton Ridge	65	— 1	29.6	3.39	14.0
Bethany	63	— 1	31.8	2.09	4.5
Bigprairie	61	1	29.6	3.57	7.0
Binola				3.56	16.5
Bladensburg	61	— 5	28.2	3.07	4.3
Bloomingburg	62	— 1	30.2	2.81	1.0
Bowling Green	61	— 1	28.8	2.70	9.0
Cambridge	63	— 1	30.7	3.17	3.0
Camp Dennison	62	2	32.1	3.84	8.2
Canal Dover	63	2	29.9	3.59	4.0
Canton	62	1	30.0	3.36	10.7
Cardington	62	— 7	28.4	3.27	11.2
Cedarville				3.31	4.5
Celina	59	— 3	28.4	4.01	12.0
Circleville	65	— 1	30.8	2.23	0.3
Clarksville	61	0	32.2	3.42	2.5
Cleveland *a*	61	3	31.6	3.97	21.8
Cleveland *b*	64	2	29.4	3.08	12.6
Clifton	62[i]	— 4[b]	28.8[e]	2.60	4.5
Coalton	68	— 1	33.2	3.26	2.0
Colebrook	59	0	27.7	4.67	22.0
Dayton *a*				3.36	8.2
Dayton *b*	62	0	31.2	3.34	5.2
Defiance	60	— 5	28.2	3.50	9.0
Delaware	61	0	29.3	2.99	9.9
Demos	62	— 1	30.6	2.78	4.0

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Ohio—Cont'd.	°	°	°	*Ins.*	*Ins.*
Dupont	60	0	28.0	1.84	3.0
Elyria	61	3	29.5	3.00	2.7
Findlay	60	— 1	29.8	3.06	11.0
Frankfort	65	0	32.6	2.69	1.0
Garrettsville	59	— 2	28.8	4.06	20.5
Granville	61	0	28.8	3.19	3.5
Gratiot	62	— 1	30.0	3.08	4.0
Greenfield	62	4	33.2	4.00	T.
Greenhill	60	1	28.5	3.36	13.0
Greenspring	62	— 2	29.4	2.94	11.6
Greenville	59	— 2	29.1	3.16	6.5
Hanging Rock	58	— 7	32.4	3.21	2.5
Hillhouse	60	— 2	28.8	5.62	36.0
Hillsboro	62	— 2	31.4	3.39	1.5
Hiram	59	— 1	28.6	4.30	25.0
Hudson	58	0	28.4	4.19	16.0
Jacksonboro	60	— 1	30.5	3.70	7.0
Kenton	60	— 1	29.8	2.93	11.0
Killbuck	60	— 1	29.4	2.68	5.8
Lancaster	65	1	32.1	2.35	2.5
Levering				3.19	9.5
Logan	67	2	33.6	2.75	
Lordstown	56	— 1	27.8	3.31	13.8
McArthur	66	— 2	31.2	2.87	2.0
McConnelsville	66	0	32.2	3.38	3.0
Mansfield				3.39	11.5
Marietta	67	4	35.8	3.10	1.0
Marion	60	— 1	31.0	3.02	13.6
Medina	61	— 2	29.2	3.48	14.0
Milfordton	58	0[b]		2.78	9.5
Milligan	65	— 2	31.0	2.73	2.0
Millport	60	1	28.2	3.61	4.0
Montpelier	59	— 6	27.1	3.10	10.5
Napoleon	60	— 6	25.6	3.48	6.0
Neapolis				3.59	7.5
New Alexandria	61	0	31.0	3.00	2.5
New Berlin	60	— 2	29.1	2.27	12.0
New Bremen	59	0	29.0		
New Holland	63	— 1	31.0	2.99	2.2
New Paris	56	— 1	30.0	3.79	8.0
New Richmond	61	— 2	35.2	3.15	3.0
New Waterford	58	1	29.6	3.36	16.0
North Lewisburg	62	— 4	27.8	3.55	8.0
North Royalton	60	1	28.8	3.43	20.5
Norwalk	63	— 1	30.0	3.15	9.0
Oberlin	62	1	30.3	2.64	9.2
Ohio State University	62	2	30.4	2.42	5.4
Orangeville	59	0	28.3	2.90	13.0
Ottawa	61	1	29.6	3.26	9.0
Pataskala	60	— 1	29.8	3.10	5.0
Perry				5.14	21.0
Philo	62	— 3	29.8	2.86	2.4
Plattsburg	60	0	30.0	2.90	6.0
Pomeroy	66	0	34.0	3.00	1.2
Portsmouth *a*				3.02	T.
Portsmouth *b*	69	0	35.2	3.02	2.0
Pulse				3.71	1.0
Richwood	60	— 5	30.1	3.46	8.5
Ridgeville Corners	60	— 7	29.3	2.58	10.0
Ripley	62	— 4	32.0	4.75	3.2
Rittman	63	0	30.2	2.66	9.5
Rockyridge	59[c]	— 5	28.4	2.90	6.5
Rosewood	60	1	29.3	4.10	9.5
Shenandoah	60	— 2	27.7	2.70	9.4
Sidney	60	0	29.6	3.33	10.8
Sinking Spring	63[c]	0[d]	31.4[c]	3.97	4.7
Somerset				2.34	1.0
Springboro				3.36	2.0
Strongsville				4.81	15.5
Thurman	68	— 2	33.8	2.22	2.0
Tiffin	62	1	30.3	3.27	12.0
Upper Sandusky	60	— 3	29.2	3.60	13.0
Urbana	60	2	29.0	2.46	8.0
Vanceburg	66	— 5	33.2	2.96	2.0
Vermillion	61	— 1	29.8	2.93	13.0
Vickery	62	— 1	29.6	2.18	5.7
Walnut				2.57	2.0
Warren	60	3	29.8	4.07	22.4
Warsaw	63	— 4	28.8	2.70	6.2
Wauseon	60	— 5	28.0	3.36	14.7
Waverly	65	— 3	32.4	3.26	2.6
Waynesville				3.19	3.0
Wellington	61	1	29.4	2.78	9.5
Westerville	61	1	31.0	3.01	7.7
Wooster	63	— 2	29.0	2.78	9.8
Youngstown				3.12	
Zanesville				2.52	2.0
Oklahoma.					
Arapaho	67	15	37.6	1.33	0.7
Beaver	65	— 2	34.4	0.20	
Burnett	72	16	40.4	2.08	
Edmond	78[b]	15	38.5[d]	1.74	9.3
Fort Reno	66	16	36.6	2.68	T.
Fort Sill	71	18	40.4	2.44	
Guthrie	64	15	36.9	1.75	5.0
Hennessey	69	15	37.4	1.41	
Hopeton	67	9	36.8	1.19	3.0
Jefferson	63	7	33.4	0.83	4.0
Kingfisher	65	17	38.4	1.09	0.5
Mangum	75	18	40.2	1.33	T.
Newkirk	63	10	34.0	1.90	5.0
Norman	62	18	39.4	1.58	1.5
Pawhuska	70	6	39.2	2.39	7.9
Perry	69	13	38.0	1.45	5.0
Prudence	69	9[c]	38.6	1.27	
Sac and Fox Agency	64	13	37.8	2.16	3.0
Stillwater	62	15	38.2	1.60	4.5
Waukomis	65	14	37.8	1.08	
Woodward	61	9	37.9	0.58	0.8
Oregon.					
Albany *b*				7.45	0.5
Alpha	59	28	43.3	13.68	
Arlington	59[d]	18[d]	40.6[d]	1.29	T.
Ashland *b*	59	24	38.4	3.14	
Aurora *1	60	32	44.0	5.57	
Aurora (near)	59	29	41.7	6.30	T.
Bandon	58	30	48.6	10.87	
Bay City	58	30	44.6	14.38	
Brownsville *1	66	23	44.4	4.84	
Bullrun	50	31	39.7	8.70	T.
Burns (near)	54	5	31.6	2.61	0.2
Cascade Locks	56	26	40.6	11.83	2.5
Comstock *1	60	30	43.9	7.30	0.5
Coquille				13.58	
Corvallis	61	29	41.6	7.57	1.0
Dayville	58	10	37.4	1.22	0.5
Ella				0.91	5.0
Eugene	60	28	43.4	5.33	T.
Fairview	60	36	49.9	14.24	
Falls City	55	29	40.0	10.79	0.6
Forestgrove	59	27	40.0	5.73	
Gardiner	66	32	47.0	14.45	
Glenora	57	28	41.4	18.48	2.0
Government Camp	54	16	33.6	10.10	47.0
Grants Pass	56	22	40.2	7.24	
Happy Valley	55	— 1	29.2	1.72	4.0
Heppner	62	9	37.0	1.22	3.0
Hood River (near)	60	21	37.6	4.96	10.5
Irvington	59	29	44.9	5.58	T.
Jacksonville	51	24	36.4	6.73	0.2
Joseph	50	3	24.6	1.35	13.5
Junction City *1	70	28	46.0	6.32	0.2
Kerby	55	25	38.7	13.70	1.4
Lafayette *1	58	30	42.8	5.29	
Lagrande	49	15	32.1	1.93	12.4
Langlois	65	29	48.7	18.15	
Lonerock	61	6	32.7	1.57	1.5
McMinnville	59	30	42.0	6.38	T.
Merlin *1	58	26	40.8	6.90	T.
Monmouth *a* *1	61	30	42.7	4.78	
Monmouth *b*	58	28	41.8	7.33	
Monroe	63	27	42.8	7.84	2.0
Mount Angel	57	28	41.7	5.80	
Nehalem				11.60	
Newberg	58	27	46.4	5.56	
Newbridge	47	— 5	24.0	1.71	10.0
Newport	58	20	45.5	11.67	
Pendleton	62	14	38.0	2.26	6.0
Placer				9.62	4.5
Prineville	56	18	34.6	0.48	
Riddles *1	60	26	38.7	4.85	
Riverside	54	—21	12.4	2.06	20.0
Salem *b*	60	27	43.3	6.58	
Sheridan *1	60	30	41.6	5.63	
Silverlake	55	— 4	31.4	1.68	8.5
Silverton *1	56	32	44.5	6.31	T.
Siskiyou *1	46	20	34.8	4.79	42.0
Sparta	45	8	24.0	3.95	37.0
Springfield *1	59	28	42.2	4.65	
Stafford	58	26	41.8	7.65	
The Dalles	59	22	37.8	2.29	8.8
Toledo	68	28	47.1	4.65	
Umatilla				0.99	1.5
Vale	50	— 9	24.0	1.36	13.5
Vernonia	58	25	40.7	6.50	
Westfork *1	50	24	37.7	2.95	1.0
Weston	63	6	36.5	2.47	6.5
Williams	59	21	43.2	7.00	
Pennsylvania.					
Altoona	59	0	29.9	2.70	
Aqueduct	66	2	35.2	2.45	0.6
Athens	61	— 1	30.4	2.57	1.2
Beaver Dam				2.95	T.
Bethlehem				1.37	
Brookville				3.87	6.4
Browers Lock				1.63	
Butler	60	1	29.4	4.19	9.2
Carlisle				2.77	0.2
Cassandra	56	4	30.3	3.63	18.0
Cedarrun				0.85	4.0
Centerhall	57	2	31.6	3.87	3.0
Chambersburg	63	5	32.6	2.47	0.1
Coatesville	67	2	35.0	2.16	0.5
Confluence	62	— 1	29.2	3.32	6.9
Coopersburg	64	6	36.4	1.69	0.2
Davis Island Dam				2.48	T.
Derry Station	61	3	32.4	3.27	4.5
Doylestown				2.68	
Driftwood				4.04	
Duncannon				2.95	
Dushore	58	— 4	28.2	5.09	4.5
Dyberry	60	— 2	28.2	1.95	1.0
East Bloomsburg				4.10	0.5
East Mauch Chunk	64	1	32.4	2.95	0.2
Easton	62	3	34.1	2.04	0.5
Ellwood Junction				2.50	4.0
Emporium	60	— 7	28.6	4.80	11.5
Ephrata	65	4	34.7	1.56	0.5
Everett	59	4	30.8		
Forks of Neshaminy *1	63	6	33.8	2.26	
Franklin	60	— 1	30.4	3.77	9.0
Frederick				1.68	
Freeport				3.27	1.0
Girardville				4.19	3.8
Grampian	56	— 2	27.7	3.96	10.0
Greensboro	64			3.53	3.0
Hamburg	63	6	37.8	2.75	0.5
Hawley	60	— 2	27.4	2.69	0.4
Hawthorn	60	1	30.2	4.25	5.5
Hews Island Dam				2.20	
Huntingdon *a*	63	8	33.2	3.19	1.5
Huntingdon *b*				2.60	1.0
Irwin				3.66	0.5
Johnstown	60	4	31.8	4.25	7.3
Karthaus				2.40	6.0
Keating				3.19	5.0
Kennett Square	65	2	35.4	2.35	0.5
Lancaster[c]	73	6	34.4		
Lawrenceville	58	— 7	26.4	2.60	4.5
Lebanon	65	4	33.0	1.75	0.4
Leroy	57	— 6	28.6	4.47	5.8
Lewisburg	63	— 1	32.4	3.98	T.
Lockhaven *a*	62	2	32.4	3.61	5.5
Lockhaven *b*				3.56	
Lock No. 4				2.78	0.7
Lycippus	61	1	32.0	3.22	6.4
Mifflin				3.00	
Nisbet				3.96	
Oil City				4.85	11.0
Ottsville				1.97	
Parker				4.06	3.0
Philadelphia	66	9	38.6	1.44	0.5
Quakertown	64	3	33.8	2.61	T.
Reading[a]			31.1	2.17	
Renovo *a*				3.33	0.5
Renovo *b*	61	— 1	31.1	3.60	3.4
Saegerstown	56	—10	28.4	5.30	24.3
St. Marys	56	— 4	27.2	3.93	7.5
Salem Corners	57	— 3	29.0	2.70	3.6
Scranton	62	0	31.6	2.10	1.5
Seisholtzville				1.75	
Selinsgrove *a*	61	3	32.8	2.61	0.5
Shawmont				1.35	
Sinnamahoning				1.35	5.5
Smethport	53	—11	26.8		
Smiths Corners				2.03	
Somerset	56	— 4	27.4	3.05	20.6
South Eaton	62	2	31.4	2.81	T.
State College	60	0	29.8	2.53	2.9
Sunbury				0.95	
Swarthmore	61	8	34.2		
Towanda	61	0	31.4	2.82	1.2
Troutrun				5.80	3.5
Uniontown	63	1	33.8	3.82	7.8
Warren	52	1	29.9	6.00	23.1
Wellsboro	58	— 3	29.6	3.78	10.0
Westchester	62	4	34.6	2.17	0.8
West Newton				2.85	0.1
Westtown[b]	61	3	31.2		
Wilkesbarre	62	5	32.6	1.72	2.0
Williamsport	61	3	32.4	4.63	T.
York	64	3	32.3	1.18	1.8
Rhode Island.					
Bristol	59	9	36.6	1.29	T.
Kingston	61	0	33.6	1.80	T.
Lonsdale				2.84	
Pawtucket	58	4	33.4	2.56	T.
Providence *a*	61	7	36.2	1.88	T.
Providence *c*	60	4	34.4	2.14	T.
South Carolina.					
Allendale	73	21	47.8	2.40	
Batesburg	70	16	44.8	4.05	
Beaufort	79	26	52.0	1.36	1.0
Blackville	74	19	46.7	2.59	1.4
Calhoun Falls				3.29	
Camden				2.79	
Cheraw *a*	72	14	41.6	2.80	T.
Cheraw *b*				2.80	T.

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
South Carolina—Cont'd.	°	°	°	*Ins.*	*Ins.*
Clemson College	64	14	41.0	3.43	
Conway	.....	.....	.....	1.53	.....
Darlington	.....	.....	.....	2.44	0.4
Edisto	.....	.....	.....	1.91	.....
Effingham	.....	.....	.....	1.77	.....
Florence	71	16	44.0	1.70	
Gaffney	.....	.....	.....	3.24	T.
Georgetown	71	25	46.6	1.60	1.0
Gillisonville	76	19	47.4	1.37	0.5
Greenville	65	11	39.6	3.84	
Greenwood	65	15	41.4	2.26	
Holland	67	13	40.2	3.52	T.
Kingstree *a*	72	16	45.6	1.77	.....
Kingstree *b*	.....	.....	.....	1.78	.....
Little Mountain	70	15	44.3	2.72	0.5
Longshore	68	13	42.5	3.03	T.
Pinopolis *1	68	23	47.0	1.18	T.
St. Georges	72	19	46.1	1.65	.....
St. Matthews	78	13	46.5	2.16	.....
St. Stephens	.....	.....	.....	1.77	.....
Santuck	69	13	42.6	3.34	T.
Shaws Fork	.....	.....	.....	2.89	2.0
Smiths Mills	.....	.....	.....	1.62	3.0
Societyhill	70	16	43.8	2.06	0.2
Spartanburg	64	11	39.5	2.22	T.
Statesburg	74	17	47.2	2.37	1.0
Summerville	77	18	48.0	1.82	2.0
Temperance	74	13	46.0	2.04	0.5
Trenton	68	19	46.8	3.04	0.3
Trial	74	13	45.5	2.08	.....
Walhalla	64	11	40.3	3.48	T.
Winnsboro	67	15	43.0	3.06	T.
Yemassee	75	20	48.2	1.02	.....
Yorkville	67	15	43.9	3.14	T.
South Dakota.					
Aberdeen	50	−16	16.9	0.14	1.0
Academy	57	− 8	29.6	0.16	3.5
Alexandria	56	−17	19.4	0.25	2.0
Armour	55	−12	30.6	0.30	3.0
Ashcroft	55	−20	20.2	0.62	6.0
Bowdle	57	−24	15.0	0.16	3.0
Brookings	54	−18	16.6	0.43	4.3
Canton	56	−16	19.2	0.75	1.9
Centerville	.....	.....	.....	0.99	2.1
Chamberlain	59	− 7	22.8	0.37	3.7
Clark	.....	.....	.....	0.25	2.5
Desmet	55	−20	16.0	0.40	4.0
Doland	55	−26	14.9	0.18	1.4
Elkpoint	52[1]	−10[1]	24.4[1]	0.91[1]	
Farmingdale	.....	.....	.....	0.44	4.5
Faulkton *	..	−18	15.4	0.25	2.5
Flandreau	56	−17	18.6	0.66	4.0
Forestburg	56	−21	17.6	0.10	1.0
Forest City	70	−15	16.6	0.60	6.0
Fort Meade	55	−12	24.2	0.56	4.6
Gannvalley	57	−15	16.3	0.50	5.0
Gary	58	−10	19.3	0.00	0.0
Grand River School	57	−21	17.2	0.29	2.9
Greenwood	58	− 5	24.0	0.17	2.1
Hartman	53	−25	17.8	0.55	1.0
Highmore	55	−16	17.5	0.27	2.7
Hotch City	56	.....	.....	0.20	2.0
Hot Springs	55	−12	20.5	0.70	5.0
Howard	55	−24	18.2	0.29	2.0
Interior	49	−16	20.5	0.30	3.0
Ipswich	54	−21	15.2	0.30	3.0
Kimball	55	− 9	19.6	0.31	4.0
Leola	52	−20	14.2	0.30	3.0
Leslie	59	−12	19.6	T.	T.
Mellette	55	−23	15.8	0.15	1.5
Menno	56	−14	19.2	0.64	1.9
Millbank	55	−11	19.6	0.17	1.5
Mitchell	53	−16	18.1	0.11	1.0
Oelricks	56	−11	22.4	0.70	5.0
Parker	55	−14	20.2	0.74	1.0
Plankinton	59	−15	17.3	0.63	6.0
Redfield	58[1]	−24	21.0	0.11	2.2
Rochford	53	−14	23.9	1.70	13.5
Rosebud	47	−12	15.2	1.30	13.0
St. Lawrence	58[c]	−21	17.8[c]	0.20	2.0
Shiloh	50	−12	13.6	T.	T.
Silver City	.....	.....	.....	1.14	8.5
Sioux Falls	57	−16	18.2	0.76	2.0
Spearfish	54	− 8	26.3	0.91	6.0
Tyndall	55	−13	17.6	0.67	4.0
Watertown	51	−21	15.8	0.25	2.5
Waubay	50	−22[c]	15.5[c]	0.29	2.9
Wentworth	.....	−15	.....	0.57	2.2
Wessington Springs	53	−16	15.3	0.25	2.5
Wolsey	.....	.....	.....	0.15	1.5
Tennessee.					
Andersonville	65	3	35.0	3.24	T.
Ashwood	63	12	39.2	6.21	0.5
Benton	69	8	39.6	3.75	
Bluff City	.....	.....	.....	2.10	2.0
Bolivar	65[4]	16[4]	39.6[4]	3.99	T.
Bristol	66	−11	33.8	2.56	3.0
Byrdstown	63	1	36.7	5.48	3.0
Carthage	.....	.....	.....	5.73	1.0
Charleston	.....	.....	.....	4.02	T.
Clarksville	63	10	36.9	4.99	3.0
Clinton	.....	.....	.....	2.51	2.0
Decatur	65	9	38.5	5.06	T.
Dover	63	6	35.6	4.54	1.5
Elizabethton	68	− 5	35.0	2.54	4.0
Elk Valley	.....	− 3	.....	3.20	3.0
Erasmus	66	.....	.....	7.43	2.9
Florence	62	11	38.0	5.02	2.0
Franklin	63	11	37.2	4.97	1.0
Grace *1	62	10	38.4	6.04	2.0
Greeneville	67	− 1	36.3	3.32	3.1
Harriman	63	8	36.4	4.74	T.
Hohenwald	62	9	37.2	6.87	0.8
Iron City	62	12	39.4	12.03	0.5
Jackson	61	16	39.6	2.45	
Johnsonville	68	9	37.6	4.99	1.0
Jonesboro *1	63	0	34.3	2.99	3.3
Kingston	.....	.....	.....	4.36	.....
Lafayette *5	60	6	36.4	4.71	T.
Lewisburg	62	13	38.8	6.64	1.0
Liberty	62	10	35.7	2.25	T.
Lynnville	64	14	39.4	6.93	0.5
McMinnville	64	10	40.4	6.05	T.
Maryville *5	67	9	38.3	3.44	1.0
Newport	70	5	36.6	2.01	2.5
Nunnelly	65	10	37.6	7.10	0.5
Oakhill	70	4	38.6	7.39	2.1
Palmetto	62	12	38.8	5.80	1.0
Peryear *5	65	10	39.8	4.05	2.0
Pope	67	8	37.8	5.33	1.0
Rogersville	67	− 1	36.2	3.38	2.5
Rugby	63	− 4	33.6	4.94	4.0
Savannah	64	15	40.0	6.14	T.
Sewanee	59	7	36.1	5.74	1.2
Silverlake	59	− 7	32.4	2.43	3.8
Springdale	63	− 4[c]	33.5[c]	3.36	1.0
Springfield	63	7	36.6	4.10	3.0
Tazewell	.....	.....	.....	4.43	4.5
Tellico Plains	67	− 3	40.2	3.96	0.5
Tracy City	60	7	35.6	7.16	1.4
Tullahoma	60	10	37.6	7.10	2.0
Union City	66	12	38.2	4.35	2.0
Waynesboro	72	12	38.7	6.78	T.
Wildersville	68	15	40.0	5.22	0.2
Yukon	60	13	38.6	8.20	T.
Texas.					
Alvin	.....	.....	.....	7.67	
Anna	73	10	44.4	2.27	
Anson	.....	.....	.....	4.10	1.0
Austin *a*	74	25	48.0	5.80	
Austin *b* *3	72	26	47.4	.....	
Ballinger	76	23	45.6	3.38	
Beaumont	70	34	53.8	2.56	
Beeville	85	29	53.2	3.20	
Blanco	78[k]	30[k]	50.2[k]	5.40[k]	
Boerne *1	75	27	48.6	4.91	
Brazoria	77	35	54.0	5.82	
Brenham	78	29	51.3	4.77	
Brighton	78	33	58.8	2.50	
Brownwood	74	24	47.5	3.60	
Burnet *1	72	26	48.0	3.74	
Camp Eagle Pass	79	24	49.8	1.33	
Coleman	76	24	45.9	4.28	
College Station	71	27	46.3	5.87	
Colorado	.....	.....	.....	3.29	6.0
Columbia	77	32	53.2	4.79	
Corsicana	72	23	48.0	3.85	
Cuero	79	30	52.6	3.20	
Dallas	75	25	45.6	4.92	
Danevang	77	30	54.2	5.57	
Dublin	76	23	44.0	3.91	
Duval	73	27	49.7	4.88	
Emory	74	20	47.4	3.32	
Estelle	78	22	46.2	3.05	
Fort Brown	81	.....	.....	1.54	
Fort Clark	73	28	49.0	2.49	
Fort McIntosh	87	28	54.6	0.28	
Fort Ringgold	86	31	56.6	0.60	
Fort Stockton	.....	.....	.....	1.74	1.5
Fredericksburg *1	73[d]	24	47.2	4.15	
Fruitland	71[c]	22	46.2	2.97	T.
Gainesville	71[c]	23[c]	45.0[c]	2.27	
Georgetown	.....	.....	.....	5.01	
Grapevine	78	23	46.0	3.16	
Hale Center	77	19	42.4	1.20	3.0
Hallettsville	79	30	53.4	3.67	
Henrietta	67	20	40.7	2.02	
Hewitt	.....	.....	.....	4.05	
Hondo	.....	.....	.....	2.20	
Houston	77	33	52.0	4.17	
Hulen	77[j]	31	54.4[c]	4.64	
Huntsville	77	27	50.5	8.06	
Jacksonville	73	23	49.6	3.40	
Jasper	.....	.....	.....	4.51	
Kaufman	70	24	45.6	.....	
Kent	.....	.....	.....	0.71	5.0
Kerrville	80	21	46.6	4.04	
Lampasas	75	22	47.0	3.36	
Lapara	.....	.....	.....	1.50	
Laureles Ranch	.....	.....	.....	2.56	
Llano *5 *	76	29	50.6	2.90	
Longview	74	26	47.2	4.20	
Luling	79	28	51.1	3.50	
Mann	80	24	49.8	4.00	
Marathon	72	.....	.....	1.68	
Mount Blanco	74	18	35.4	1.25	2.0
New Braunfels	75	29	51.2	4.29	
Panter	.....	.....	.....	2.83	
Paris *a*	72	22	44.8	1.88	
Paris *b* *3	66	23	45.4	.....	T.
Point Isabel *1	80	40	61.8	0.40	
Rhineland	70	22	41.4	2.12	T.
Rockisland	76	30	53.2	6.21	
Rockport *1	70	36	57.4	.....	
Runge	78	30	53.4	3.06	
Sabine	74	31	53.4	4.90	
San Antonio	78	32	53.9	2.97	
San Marcos	78	26	51.1	4.97	
Sherman	70	25	46.6	2.74	
Sugarland	75	30	51.9	5.10	
Sulphur Springs	70	23	47.0	2.21	
Temple *a*	74	25	48.0	5.34	
Temple *b*	70	23	47.5	3.94	
Turnersville	74	25	49.8	.....	
Tyler	69	24	43.1	3.22	
Valentine	66	.....	.....	0.30	3.0
Victoria	.....	.....	.....	2.69	
Waco	74	28	50.4	4.70	
Waxahachie	72	21	46.0	4.75	
Weatherford	76	22	45.8	3.86	
Wichita Falls	.....	.....	.....	3.26	
Utah.					
Alpine	.....	.....	.....	0.87	6.4
Bluecreek *1	45	− 3	22.7	0.85	8.1
Brigham	.....	.....	.....	1.46	.....
Castledale	51	− 6	24.2	0.27	2.7
Cisco	52	−14	18.6	0.75	7.5
Corinne	59	− 4	26.8	0.60	6.0
Deseret	58	−17	21.6	0.80	8.0
Elgin	74	0	29.2	0.07	0.7
Fillmore	65	− 7	26.6	1.03	.....
Fish Springs	61[c]	2[c]	27.7[c]	0.73	.....
Fort Duchesne	50	−19	13.1	0.12	1.2
Frisco	61	4	32.4	T.	T.
Giles	54	− 6	25.1	0.43	2.5
Grover	53	− 6	26.2	0.42	4.0
Heber	50	−20	17.8	1.55	13.0
Huntsville	.....	.....	.....	2.19	20.0
Kanab	.....	.....	.....	0.60	
Kelton *1	40	− 5	22.1	0.35	3.5
Levan	54	−12	23.6	1.91	21.0
Loa	58	−15	23.3	0.20	2.0
Logan	55	−10	23.1	0.80	.....
Manti	55	−10	22.4	1.30	13.0
Marysvale *1	48	− 6	22.7	1.40	14.0
Millville	.....	.....	.....	1.48	.....
Minersville	57	− 1	28.0	0.63	4.5
Moab	55	3	26.6	1.13	7.0
Mount Pleasant	60	− 7	25.0	2.10	21.0
Ogden *a* *1	56	2	26.0	1.50	15.0
Pahreah	62	12	34.8	T.	T.
Park City	47	4	25.8	1.80	18.0
Parowan	59	−10	27.8	1.60	16.0
Pinto	53	− 9	28.4	0.49	3.5
Promontory *1	45	− 5	22.8	0.50	5.0
Provo	60	− 1	29.4	1.05	.....
Richfield	58	−14	25.5	1.05	10.5
St. George	64	5	36.4	0.33	
Scipio	59	−26	25.0	1.85	9.0
Snowville	46	− 8	22.0	1.70	17.0
Soldier Summit [g]	48	−20	16.8	2.35	23.5
Terrace	.....	.....	.....	0.10	1.0
Thistle	50	−20	22.8	.....	.....
Tooele	58	5	27.4	1.25	14.1
Tropic	57	4	28.0	0.18	
Vernal	44	−13	16.0	0.50	3.8
Vermont.					
Bennington	61	− 4	30.5	1.88	.....
Brattleboro	64	3	30.8	2.65	6.5
Burlington	59	− 4	30.9	2.65	10.5
Chelsea	54	− 7	24.6	2.12	13.0
Cornwall	61	− 3	28.8	3.24	8.0
Derby	57	−13	24.8	2.93	1.2
Enosburg Falls	68	−16	25.4	2.90	11.0
Hartland	58	0	26.9	2.18	4.1
Jacksonville	50	− 6	22.4	1.68	3.5
Manchester	62	− 2	28.1	2.04	2.9
St. Johnsbury	57	−10	25.0	2.20	10.5

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Vermont—Cont'd.	°	°	°	*Ins.*	*Ins.*
Vernon [**]	56	— 4	27.4	3.07	4.5
Wells	60	— 4	28.1	2.98	8.5
Woodstock	54	—10	25.8	2.21	8.5
Virginia.					
Alexandria	67	3	37.5	1.62	2.0
Ashland	69	— 2	39.2	2.42	2.0
Barboursville	63	0	35.2	3.01	1.5
Bedford	59	4	32.6	1.82	1.5
Bigstone Gap	68	— 4	35.2	3.85	3.0
Birdsnest [*1]	68	0	39.0	1.75	1.5
Blacksburg	73	— 3	34.2	1.55	5.0
Buckingham	.....	.....	.....	1.70	0.2
Burkes Garden	59	— 4	31.5	4.06	12.0
Callaville	68	— 2	39.4	2.08	1.0
Charlottesville	62	4	37.1	2.30	3.0
Christiansburg	.....	.....	.....	2.08	3.5
Cliftonforge	53	6	30.8	1.23	3.5
Columbia	.....	12	.....	0.60	1.0
Dale Enterprise	69	— 5	33.5	1.00	1.0
Farmville [1]	69	20	42.5	1.02	
Fontella	68	5	39.8	2.09	1.0
Fredericksburg	67	0	37.4	1.82	1.0
Hampton	66	13	42.3	1.23	T.
Hot Springs	60	— 2	29.6	3.20	4.2
Lexington	63	— 8	34.1	1.47	3.5
Manassas	66	— 2	36.5	1.96	3.0
Marion	66	—11	33.8	3.61	7.0
Meadow Dale	55	— 7	28.6	3.21	6.0
Miller School	.....	.....	... ..	1.28	1.8
Petersburg	70	3	40.3	1.97	2.0
Quantico	64	— 2	34.1	.....	.....
Radford	.....	.....	.....	1.09	6.0
Richmond (near)	69	2	39.5	1.95	1.5
Rockymount	64	— 3	37.1	1.65	2.0
Salem	67	6	40.5	2.13	1.5
Scottsburg	68	.....	.....	1.66	1.5
Speers Ferry	.....	.....	.....	3.49	0.3
Spottsville	70	0	40.6	2.36	1.5
Stanardsville	62	— 2	36.1	2.10	1.0
Staunton	68	3	37.0	1.14	1.0
Stephens City	65	— 1	34.8	2.02	0.8
Sunbeam	70	4	42.2	2.37	0.1
Warrenton	60	7	36.0	1.89	2.0
Warsaw	67	— 2	36.9	1.90	2.0
Westbrook Farm	67	2	39.4	.....	.....
Westpoint	67	3	38.2	2.57	1.0
Woodstock	66	0	34.2	1.04	1.0
Wytheville	64	— 2	33.2	2.24	3.5
Washington.					
Aberdeen	56	30	42.8	10.13	
Anacortes	.....	.....	.....	5.08	1.0
Ashford	.....	.....	.....	7.96	0.7
Bremerton	57	29	42.8	5.71	
Bridgeport	71	4	37.1	....	.....
Brinnon	57	30	41.6	9.55	
Cedar Lake	.....	.....	.....	13.78	2.0
Cedonia	45	4	27.8	1.11	12.0
Centerville	60	14	35.8	2.17	4.5
Chehalis	58	18	42.2	5.67	
Cheney	.....	.....	.....	0.90	8.0
Clearwater	52	30	42.4	22 16	
Cle Elum	55	10	32.2	4.12	17.2
Colfax	53	19	35.6	3.36	16.5
Colville	57	20	40.0	1.68	16.5
Conconully	48	1	28.0	1.60	15.9
Connell	.....	.....	.....	0.77	7.0
Coulee City	49	2	29.7	0.82	8.0
Coupeville	56	30	42.2	3.11	T.
Crescent	46	6	30.1	2.44	11.5
Dayton	59	1	37.2	3.19	.....
Ellensburg	56	14	32.7	0.58	1.8
Ellensburg (near)	54	18	32.8	0.70	4.0
Grandmound	57	25	41.6	4.95	
Hooper	59	— 2	34.8	1.56	.....
Kennewick	64	10	37.9	1.02	3.0
Lacenter	57	25	41.4	6.69	
Lakeside	52	12	31.2	1.56	12.0
Lind	58[4]	7[4]	31.5[4]	1.23	10.4
Loomis	55	7	29.9	0.60	6.0
Monte Cristo	49	20	36.1	15.07	42.5
Mottinger Ranch	59	16	36.4	1.21	2.5
Moxee Valley	64	18	38.2	0.59	3.2
New Whatcom	57	25	43.6	5.17	1.8
Northport	44	2	28.1	2.39	20.7
Olga	58	25	42.2	4.85	1.0
Olympia	55	30	43.2	7.33	
Pinehill	57	21	37.2	3.49	14.1
Pomeroy	59	17	37.9	2.09	5.5
Port Townsend	57	33	44.4	2.20	T.
Pullman	50	15	33.1	3.54	19.0
Republic	46	4	27.8	.....	.....
Rosalia	51	9	32.8	1.75	6.7
Shoalwater Bay [*10]	58	35	45.2	.....	
Snohomish	56	29	43.2	3.67	T.
Southbend	58	30	44.2	10.38	
Sunnyside	62	12	34.9	0.66	5.0

Stations	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Washington—Cont'd.	°	°	°	*Ins.*	*Ins.*
Twin	57	29	41.7	9.68	
Union	56	27	42.4	11.54	T.
Vancouver	60	27	42.2	5.86	
Vashon	58	30	42.4	5.78	
Waterville	54	— 2	28.2	1.36	13.5
Wenatchee (near)	58	5	28.8	1.74	18.3
West Virginia.					
Beckley	65	—14	31.0	2.01	3.5
Beverly	62	— 3	31.9	3.83	11.0
Bluefield	61	— 5	32.8	3.83	8.0
Buckhannon *b*	64	— 8	32.0	.....	....
Burlington	64	3	32.2	1.55	2.5
Central	67	— 2	33.0	3.11	5.0
Charleston	.....	.....	.....	3.36	5.5
Dayton	65	— 1	32.8	3.75	3.0
Eastbank	68	— 4	37.4	2.53	4.0
Elkhorn	65	— 6	34.8	2.75	6.6
Fairmont	.....	.....	.....	2.87	3.0
Glenville	64	— 5	34.4	3.68	3.3
Grafton	63	0	32.7	3.22	3.5
Green Sulphur	61	—17	32.8	2.91	5.5
Hamlin	71	3	37.7	2.36	.....
Harpers Ferry	.....	.....	.....	2.88	0.5
Hinton *a*	.....	.....	.....	2 49	8.0
Hinton *b*	63	— 9	32.9	.....	.....
Huntington	71	0	33.4	2.52	3.5
Kingwood	61	0	31.8	4.40	3.0
Marlinton	60	—15	28.8	3.09	8.0
Martinsburg	63	3	34.6	1.70	1.0
New Martinsville	69	4	34.5	3.41	3.0
Nuttallburg	77	—10	34.3	3.70	2.5
Oceana	69	—14	33.2	3.56	.....
Oldfields	63	— 3	31.0	1.30	0.5
Parsons	62	0[b]	34.2[b]	1.22	4.0
Philippi *a*	68	1	35.0	3.83	6.8
Point Pleasant	60	1	35.8	2.96	1.0
Powellton	61	— 5	31.1	... ..	....
Romney	63	4	33.2	1.54	T.
Rowlesburg	.....	.....	.....	3.10	8.4
Spencer	70	4	35.2	2.83	2.7
Uppertract	65	— 1	34.3	1.60	6.0
Wellsburg	61	1	30.6	2.61	0.5
Weston *a*	...	.....	.....	3.85	4.0
Weston *b*	67	— 4	35.0	.....	.....
Wheeling *a*	.....	.....	.....	3.13	1.8
Wheeling *b*	64	5	35.4	3.04	1.8
Wisconsin.					
Amherst	52	—10	19.4	1.40	4.0
Antigo	42[1]	—14[4]	17.4[4]	1.24	8.0
Barron	46	—14	16.4	2.02	7.2
Bayfield	44	— 5	21.1	2.30	21.0
Beloit	49	— 5	25.0	2.03	0.7
Brodhead	50	— 6	24.4	1.56	T.
Butternut	45	—20	15.4	2.70	18.0
Chilton	48	— 3	23.0	0.50	T.
Citypoint	51	—16	17.9	1.16	10.0
Delavan	49	— 7	24.2	1.48	T.
Dodgeville	48	— 9	21.2	1.48	4.0
Easton	47	—11	20.2	1.07	3.5
Eau Claire	46	—10	19.4	2.20	12.5
Florence	44	—13	18.8	1.96	8.0
Fond du Lac	44	— 7	22.5	1.41	2.2
Grand River Locks	.....	.....	.....	1.80	3.0
Hartford	50	— 9	24.1	1.70	3.0
Hartland	47	— 7	23.8	1.72	2.4
Harvey	52	— 6	23.6	1.62	1.6
Heafford	41	—11	17.2	1.80	12.5
Hillsboro	48	—10	20.4	1.80	7.0
Koepenick [*1]	48	—16	18.4	1.60	.....
Lancaster	46	—10	19.0	2.09	6.0
Lincoln [g]	45	0	27.2	0.40	3.0
Madison	45	— 7	22.6	1.37	0.8
Manitowoc	48	— 6	24.8	1.33	0.4
Meadow Valley	49	—14	17.8	1.62	7.5
Medford	53	—19	15.8	2.50	16.0
Menasha	.....	.....	.....	1.18	1.9
Neillsville	47	—14	16.8	2.62	17.0
New Holstein	50	—10	24.5	1.45	1.0
New London	47	— 8	20.6	1.45	1.0
North Crandon	.....	.....	.....	2.50	25.0
Oconto	50	— 8[e]	22.9[e]	0.77	1.1
Osceola	51	—15	17.8	1.54	2.6
Oshkosh	46	— 5	23.8	0.82	4.8
Pepin	48	—10	19.4	1.57	7.0
Pine River	48	—10	20.8	1.63	4.1
Portage	45	— 8	21.2	2.10	4.0
Port Washington	56	— 9	25.1	1.21	0.1
Prairie du Chien	50	—10	23.1	2.36	13.0
Racine	50	— 4	26.6	2.04	.....
Sharon	58	— 8	22.5	1.43	1.0
Shawano	48	— 9	20.4	1.19	2.2
Sheboygan	48	— 4	25.0	1.53	0.5
Spooner	47	—14	20.8	1.39	5.0
Stevens Point	44	—11	18.8	0.88	4.0
Sturgeon Bay Canal [*10]	45	— 6	23.2	.....	.....
Valley Junction	49	—13	19.0	1.37	5.0

Stations	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Wisconsin—Cont'd.	°	°	°	*Ins.*	*Ins.*
Viroqua	48	—11	19.8	1.90	8.5
Watertown	47	— 8	22.0	1.74	3.8
Waukesha	48	— 7	23.3	1.18	1.0
Waupaca	46	— 8	20.6	1.35	2.8
Wausau	42	—11	15.8	1.65	10.5
Westbend	50	0	25.8	1.90	....
Westfield	45	— 9	20.6	1.25	3.5
Whitehall	46	—19	18.9	2.80	16.5
Wyoming.					
Alcova	51	—10	20.6	0.32	3.2
Basin	43[1]	—19	11.8	0.27	2.7
Bedford	40	—16	18.9	0.97	10.2
Bigpiney	39	—23	13.4	0.55	5.5
Bitter Creek	50	—29	13.7	1.70	17.0
Buffalo	59	—12	23.2	0.74	7.4
Burlington	50	— 7	17.9	0.28	2.8
Burns	55	—22	13.9	1.00	10.0
Carbon	53	—12	22.5	0.37	.....
Centennial	46	—12	21.6	1.90	19.0
Cody	68	— 8	29.1	T.	T.
Dome Lake	46	— 6	19.1	2.90	29.0
Embar	58	— 5	26.3	1.00	10.0
Evanston	45	—23	16.6	1.75	17.5
Fort Laramie	59	— 3	30.2	0.14	2.1
Fort Washakie	59	— 5	23.2	0.29	2.9
Fort Yellowstone	35	— 2	18.8	1.90	19.0
Fourbear	55	— 7	26.9	0.09	1.2
Hyattville	54	— 8	24.6	1.00	10.0
Iron Mountain	51	— 1	27.0	0.38	4.0
Kimball Ranch	55	— 8	29.4[f]	0.10	1.0
Laramie	48	—21	18.2	0.61	9.5
Lovell	54	—16	18.0	0.19	3.4
Lusk	54	—10	24.4	0.26	.....
Rawlins	44	—19	21.2	0.93	9.3
Rocksprings [j]	52	—23	18.1	.....	.....
Sheridan	58	—12	23.6	0.70	7.0
Sherman	.....	.....	.....	1.50	15.0
Thayne	39	—19	20.0	0.63	6.3
Thermopolis	49	— 6	21.6	0.48	4.8
Wamsutter	50	—22	11.6	0.30	3.0
Puerto Rico.					
Adjuntas	84	49	66 8	3.44	
Aguadilla	83	65	75.8	2.64	
Arecibo	85	59	73.8	.....	
Bayamon	91	56	75.4	3.10	
Caguas	89	55	72.5	1.50	
Canovanas	.....	.....	.....	3.23	
Cayey	81	51	67.6	5.22	
Comario	93	46	68.2	.....	
Corozal	91	52	72.3	4.53	
Fajardo [1]	86	60	74.9	0.79	
Hacienda Coloso	93	57	74.4	1.45	
Hacienda Monserraté	.....	.....	.....	1.25	
Humacao	88	66	76.8	2.96	
Isabela	89	62	75.0	3.18	
La Isolina	86	58	71.4	6.35	
Lajas	92	57	76.8	0.80	
Luquillo	86	63	74.2	4.86	
Manati	94	58	74.4	5.93	
Mannabo	.....	.....	.....	1.44	
Mayaguez	91	62	77.6	1.04	
Morovis	85	56	72.4	2.99	
Port America	89	57	75.7	0.86	
Puerta de Tierra	88	66	77.0	2.31	
San German	94	58	73.6	1.96	
San Lorenzo	91	53	73.0	1.77	
Vieques	86	62	75.1	0.30	
Yanco	88	60	78.0	0.05	
Mexico.					
Ciudad P. Diaz	74	32	53.3	1.67	
Coatzacoalcos [2]	.....	.....	72.6	.....	
Leon de Aldamas	76	32	56.3	0.04	
Puebla	71	41	57.9	0.00	
Tampico [2]	.....	.....	64.2	.....	
Vera Cruz [2]	.....	.....	71.6	.....	
New Brunswick.					
St. John	51	2	28.6	5.55	22.5

Late reports for November, 1899.

Stations	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.					
Livingston	77	28	56.6	4.00	
Alaska.					
Orca	48	28	36.4	13.02	
Arizona.					
Ingleside	85	34	59.4	0.47	
California.					
Chino	.....	.....	.....	1.25	
Glendora	.....	.....	.....	1.74	
Hill Ranch	80	33	55.1	0.82	
Kernville	...	.....	.....	0.89	
Lagrange [*5]	72	38	55.4	4.25	
Pilot Creek	.....	.....	.....	11.00	1.0

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Colorado.	°	°	°	*Ins.*	*Ins.*
Springfield	.....	.....	.....	2.75	
Massachusetts.					
Leicester	58	18	36.8	2.86	T.
Mississippi.					
Holly Springs	74	31	54.2	3.38	
Windham	82	24	57.2	2.27	
Nebraska.					
Central City	.....	.....	.....	0.98	
Redcloud *a*	.....	.....	.....	0.97	
New Mexico					
Clayton	72	9	40.5	2.00	
Shattucks Ranch	80	19	47.2	3.15	1.0
Winsors Ranch	63	8	35.0	1.20	
South Dakota.	°	°	°	*Ins.*	*Ins.*
Rochford	70	2	36.6	0.65	6.5
Rosebud [9]	67	7	34.6	0.20	2.0
Texas.					
College Station	76	31	56.3	1.55	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. ÷ 4.
[2] Mean of 8 a. m. + 8 p. m. ÷ 2.
[3] Mean of 7 a. m. + 7 p. m. ÷ 2.
[4] Mean of 6 a. m. + 6 p. m. ÷ 2.
[5] Mean of 7 a. m. + 2 p. m. ÷ 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "*a*" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

CORRECTION.

The following changes have been made in the names of stations:

Arizona, Dragoon, changed to Russellville.

TABLE III.—*Mean temperature for each hour of seventy-fifth meridian time, December*, 1899.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midn't.	Mean.
Bismarck, N. Dak....	11.4	11.4	11.5	11.6	11.5	11.3	11.4	10.5	10.0	9.7	11.8	14.6	17.2	19.3	20.6	21.5	21.7	19.7	17.3	15.6	14.2	13.4	12.0	11.3	14.2
Boston, Mass	34.4	33.7	33.5	33.3	32.6	32.5	32.6	33.6	34.8	36.0	38.0	39.8	40.2	40.9	40.7	39.9	38.7	37.5	36.2	35.7	35.1	34.8	34.4	33.9	35.9
Buffalo, N. Y.....	31.1	30.6	30.4	30.3	30.0	29.8	29.9	30.1	30.1	30.4	31.4	31.9	32.4	32.6	32.6	32.6	32.3	31.7	31.2	30.9	30.7	30.5	30.2	30.2	31.0
Cedar City, Utah....	28.6	28.6	27.8	27.1	27.0	26.7	26.3	26.5	26.0	25.5	28.7	31.9	34.4	36.4	38.4	39.4	39.5	39.5	35.8	33.8	31.7	30.5	30.1	29.2	31.2
Chicago, Ill.....	26.5	25.9	25.3	24.9	24.4	24.1	23.7	24.0	24.1	24.4	25.5	27.1	28.5	29.6	30.7	31.4	31.7	31.4	30.2	28.9	28.0	27.0	26.3	25.5	27.0
Cincinnati, Ohio....	31.8	31.4	31.2	30.8	30.5	30.4	29.7	29.7	29.8	30.5	32.0	34.0	35.5	36.7	37.6	37.9	37.6	37.3	36.1	35.0	34.1	33.2	32.1	31.1	33.2
Cleveland, Ohio	30.5	29.9	29.6	29.2	29.2	28.5	28.0	27.9	27.9	28.6	29.6	30.6	31.7	32.8	33.3	33.4	33.2	32.8	32.3	31.8	31.2	30.7	30.2	30.0	30.5
Detroit, Mich.....	28.7	28.5	28.2	27.9	27.5	26.9	26.6	26.7	26.0	25.7	27.6	28.9	29.9	30.7	31.1	31.3	31.0	30.0	29.5	29.2	28.6	28.3	27.9	27.7	28.6
Eastport, Me.....	29.6	29.5	29.5	29.3	29.2	29.4	29.4	29.8	30.5	30.9	31.6	32.5	32.9	32.9	32.4	31.9	31.1	30.5	30.1	29.6	28.9	28.6	28.5	28.5	30.3
Galveston, Tex.....	55.6	55.5	55.2	54.9	54.5	54.2	53.8	53.2	52.5	53.2	54.6	55.4	56.2	57.0	57.5	58.0	58.1	57.8	57.0	56.5	56.3	56.0	55.7	55.4	55.6
Havre, Mont.....	20.8	20.7	20.1	19.8	19.4	19.4	19.6	20.1	19.5	19.0	19.3	20.5	21.6	23.6	24.5	25.1	25.4	24.5	23.1	21.4	20.5	19.8	19.7	19.6	21.1
Independence, Cal..	41.7	40.9	40.4	39.6	38.7	37.4	37.0	37.1	35.8	35.4	36.9	39.8	42.9	45.7	48.7	50.9	52.3	52.4	50.6	48.1	46.2	44.7	43.5	42.2	42.9
Kalispell, Mont	25.6	25.1	24.8	24.6	24.3	24.7	24.8	24.5	24.0	24.1	24.2	25.2	26.1	27.4	28.8	29.9	30.1	29.9	28.6	28.2	27.8	27.1	26.5	26.0	26.3
Kansas City, Mo.....	29.9	29.3	28.6	28.1	27.3	26.6	26.5	26.5	26.2	26.9	28.3	30.1	32.1	33.5	34.2	34.5	34.6	33.9	32.5	32.0	30.8	30.6	30.1	29.5	30.1
Key West, Fla.....	70.0	69.6	69.0	68.9	68.9	68.8	68.6	69.4	70.0	71.1	72.2	72.2	73.0	73.0	73.0	72.7	71.9	71.1	70.7	70.7	70.5	70.3	70.2	70.1	70.7
Marquette, Mich	23.2	22.9	22.4	22.2	21.6	21.2	21.0	20.7	20.9	21.5	22.6	23.6	24.5	24.8	25.2	25.2	24.5	23.8	23.2	22.8	22.9	22.7	22.5	22.3	22.8
Memphis, Tenn.....	40.8	40.0	39.1	38.6	38.0	37.5	36.9	36.6	37.0	38.7	40.6	42.4	43.7	44.9	45.8	46.2	46.0	44.8	43.8	43.2	42.0	41.6	41.1	40.7	41.3
Mt. Tamalpais, Cal..	48.3	48.1	47.9	48.0	47.6	47.4	46.7	46.8	46.0	46.0	45.3	45.7	46.5	47.1	48.0	48.3	48.8	49.0	48.8	48.5	48.3	48.6	48.9	48.0	47.6
New Orleans, La.....	52.2	51.7	51.4	50.7	50.3	49.8	49.4	49.1	49.0	50.6	53.2	55.4	57.3	58.5	59.0	59.2	59.3	57.9	56.2	55.0	53.8	53.2	52.5	52.0	53.6
New York, N. Y.....	35.6	35.4	34.9	34.5	34.1	33.6	33.6	33.8	34.0	35.1	36.8	38.3	39.1	40.5	40.8	40.5	39.5	38.5	37.6	37.3	36.5	36.0	35.1	34.6	36.5
Philadelphia, Pa.....	36.0	35.7	35.1	34.6	34.2	33.8	33.8	34.3	35.3	37.0	38.8	40.5	41.3	42.4	42.3	41.8	40.6	39.7	38.7	38.2	37.1	36.5	35.9	35.5	37.5
Pittsburg, Pa.....	32.3	31.8	31.3	31.1	30.7	30.9	31.3	31.4	31.3	32.5	33.5	34.8	36.2	37.2	37.8	37.6	37.0	36.0	34.7	34.1	33.3	33.2	32.5	32.0	33.5
Portland, Oreg.....	42.8	42.9	42.7	42.6	42.5	42.1	42.0	41.9	41.3	40.8	40.6	41.0	42.1	43.2	44.5	45.5	46.0	46.4	46.1	45.1	44.4	43.9	43.4	42.8	43.2
St. Louis, Mo.....	31.9	31.4	30.8	30.1	29.6	29.5	29.1	29.2	29.1	30.0	31.8	33.8	35.1	36.5	37.5	37.8	37.8	36.8	35.9	35.3	34.3	33.2	32.2	31.5	32.9
St. Paul, Minn.....	20.5	20.0	19.5	19.2	18.8	18.1	17.7	17.5	17.2	17.3	18.4	20.3	21.9	23.1	24.5	25.3	25.6	25.0	23.8	22.9	22.2	21.4	20.9	20.4	20.9
Salt Lake City, Utah.	27.9	27.2	26.4	25.9	25.0	25.1	24.4	25.3	24.0	23.9	24.4	27.1	29.0	31.5	33.6	34.9	34.6	34.2	32.3	30.8	30.0	29.3	28.5	27.4	28.4
San Diego, Cal.....	55.7	54.9	54.4	54.1	53.8	53.3	52.7	52.4	52.0	52.3	53.5	57.6	60.5	62.4	64.5	65.3	64.6	64.0	63.2	61.1	59.6	58.4	57.4	56.6	57.7
San Francisco, Cal...	48.8	48.4	47.8	47.4	46.7	46.4	46.0	46.9	45.9	45.7	45.7	46.6	48.1	49.4	50.6	52.1	53.2	53.7	53.4	52.1	51.3	50.8	50.3	49.5	49.0
Santa Fe, N. Mex ...	28.8	28.4	27.9	27.3	26.5	26.2	26.1	25.8	26.1	27.5	30.3	33.4	35.6	37.0	38.8	40.0	40.8	39.7	36.9	34.3	32.6	31.9	30.5	29.5	31.8
Savannah, Ga.....	48.4	47.6	46.7	46.1	45.6	45.2	44.8	45.1	46.3	49.6	52.6	55.1	56.4	57.4	58.1	57.7	56.3	53.7	52.3	51.5	50.5	49.9	48.8	48.3	50.6
Washington, D. C....	33.1	32.6	31.6	31.4	31.0	30.9	30.3	31.4	32.8	35.7	39.3	41.4	43.0	44.4	44.7	44.0	42.4	40.7	38.6	37.1	35.8	35.2	34.2	33.4	36.5
West Indies.																									
Basseterre, St. Kitts.	72.8	72.8	72.7	72.7	73.1	73.8	77.1	79.0	80.3	80.7	81.5	82.0	81.6	80.8	80.0	78.8	76.5	75.4	74.8	74.7	74.5	74.2	73.7	73.2	76.5
Bridgetown, Bar.....	74.3	73.8	73.7	73.4	73.5	74.8	79.2	81.5	83.0	83.7	83.8	83.7	83.5	83.0	82.3	80.8	78.8	77.5	76.7	76.0	75.4	75.1	74.7	74.6	78.2
Cienfuegos, Cuba ...	64.8	63.9	63.4	62.9	62.7	62.6	62.7	65.7	69.8	73.5	75.6	77.2	78.3	79.1	78.7	78.0	76.3	73.4	70.7	69.5	67.9	67.2	66.0	65.1	69.8
Havana, Cuba.....	68.7	68.1	67.5	67.3	67.2	66.9	67.2	68.0	71.5	73.6	75.2	76.0	76.3	75.9	75.8	75.4	74.2	73.2	72.3	71.6	70.8	70.3	69.6	69.1	71.3
Kingston, Jamaica..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port of Spain, Trin..	73.3	72.9	72.6	72.5	72.5	73.0	77.2	80.5	82.5	84.0	84.9	84.5	83.9	83.6	82.7	81.9	80.5	79.0	78.1	77.5	76.2	75.8	75.1	74.4	78.3
P. Principe, Cuba ...	64.0	63.4	63.1	62.9	62.8	62.6	63.0	65.7	69.2	72.5	74.4	75.5	76.6	76.5	76.1	75.1	73.7	70.8	68.8	67.5	66.3	65.7	65.2	64.6	68.6
Roseau, Dominica ..	72.9	73.0	73.0	72.9	73.1	73.6	76.2	79.8	81.7	82.8	82.8	83.5	83.4	83.2	82.8	81.0	78.5	76.7	75.8	75.4	74.9	74.3	74.0	73.7	77.5
San Juan, P. R.....	73.3	73.1	72.8	72.6	72.4	73.1	74.0	75.5	78.1	79.6	80.1	80.1	80.5	80.0	79.3	78.1	77.2	76.2	76.3	75.9	75.1	74.5	74.0	73.2	76.0
Santiago de Cuba...	68.6	68.2	67.7	67.5	67.3	67.3	68.1	70.0	73.8	76.5	79.2	80.5	81.0	81.5	80.8	79.6	77.4	75.3	73.8	72.6	71.5	70.9	70.0	69.3	73.3
Santo Domingo, S. D.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Willemstad, Curaçao	77.5	77.0	76.9	76.8	76.7	76.8	78.5	80.1	81.2	81.6	82.4	82.1	82.5	81.9	81.3	80.9	79.7	79.0	78.9	78.9	78.7	78.6	78.1	77.9	79.3

TABLE IV.—*Mean pressure for each hour of seventy-fifth meridian time, December*, 1899.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midn't.	Mean.
Bismarck, N. Dak....	28.326	.321	.317	.318	.315	.314	.315	.320	.326	.331	.338	.340	.330	.323	.313	.311	.314	.316	.319	.321	.325	.328	.329	.330	.322
Boston, Mass.....	29.911	.915	.911	.905	.902	.907	.914	.924	.932	.934	.914	.893	.880	.875	.880	.886	.898	.909	.919	.921	.924	.923	.919	.913	.909
Buffalo, N. Y.....	29.138	.138	.146	.141	.137	.137	.143	.146	.155	.159	.154	.139	.123	.118	.120	.126	.130	.141	.147	.148	.149	.147	.145	.141	.140
Cedar City, Utah....	24.342	.344	.335	.333	.333	.333	.327	.326	.333	.339	.349	.367	.369	.355	.344	.317	.309	.311	.312	.315	.319	.324	.326	.332	.333
Chicago, Ill.....	29.143	.140	.142	.146	.142	.140	.143	.150	.152	.160	.170	.164	.151	.139	.128	.130	.135	.139	.144	.148	.147	.146	.149	.150	.146
Cincinnati, Ohio	29.421	.419	.423	.424	.420	.424	.436	.442	.450	.460	.458	.442	.425	.412	.412	.415	.419	.421	.425	.429	.429	.431	.435	.434	.429
Cleveland, Ohio	29.185	.185	.184	.182	.181	.185	.192	.193	.201	.207	.201	.185	.173	.169	.174	.182	.185	.191	.197	.201	.197	.194	.191	.189	.188
Detroit, Mich.....	29.201	.195	.203	.201	.194	.197	.199	.202	.208	.214	.217	.203	.191	.184	.185	.192	.199	.205	.211	.216	.213	.211	.210	.210	.204
Dodge, Kans	27.487	.483	.483	.488	.484	.479	.475	.469	.471	.480	.484	.480	.462	.437	.425	.423	.427	.433	.442	.458	.466	.471	.478	.485	.465
Eastport, Me	29.948	.950	.951	.947	.945	.947	.948	.954	.959	.959	.944	.949	.918	.913	.914	.917	.923	.932	.942	.947	.951	.954	.950	.949	.941
Galveston, Tex.....	30.049	.044	.041	.041	.041	.040	.044	.046	.054	.078	.090	.088	.065	.038	.022	.014	.011	.012	.021	.031	.042	.048	.055	.058	.045
Havre, Mont.....	27.367	.366	.369	.370	.376	.376	.375	.378	.379	.378	.390	.402	.402	.389	.375	.368	.367	.370	.373	.374	.375	.380	.380	.385	.378
Independence, Cal..	26.095	.096	.093	.091	.091	.094	.089	.085	.094	.104	.113	.127	.138	.126	.096	.077	.066	.060	.059	.054	.061	.066	.075	.080	.089
Kalispell, Mont	26.971	.974	.974	.972	.974	.973	.971	.966	.966	.967	.972	.980	.984	.972	.959	.949	.947	.955	.960	.966	.966	.971	.973	.975	.968
Kansas City, Mo.....	29.122	.116	.119	.124	.118	.115	.114	.116	.124	.132	.141	.136	.116	.093	.082	.078	.085	.090	.096	.103	.111	.115	.120	.124	.112
Key West, Fla.....	30.056	.053	.047	.047	.047	.051	.059	.065	.090	.099	.092	.071	.048	.033	.028	.028	.033	.037	.044	.049	.058	.063	.062	.059	.055
Marquette, Mich	29.103	.103	.107	.103	.097	.094	.089	.091	.090	.096	.102	.095	.084	.080	.082	.090	.098	.103	.107	.108	.107	.105	.107	.107	.098
Memphis, Tenn.....	29.708	.709	.715	.715	.717	.721	.735	.746	.763	.776	.784	.773	.744	.720	.708	.708	.710	.712	.715	.718	.719	.723	.723	.724	.729
Mt. Tamalpais, Cal..	27.647	.646	.645	.639	.638	.636	.629	.621	.626	.634	.645	.655	.666	.662	.645	.629	.618	.617	.619	.630	.617	.618	.626	.631	.635
New Orleans, La.....	30.073	.067	.068	.069	.070	.069	.076	.088	.103	.113	.116	.106	.079	.056	.042	.038	.037	.041	.049	.060	.073	.079	.084	.083	.073
New York, N. Y.....	29.734	.735	.734	.729	.727	.732	.736	.741	.751	.751	.735	.716	.698	.694	.695	.703	.716	.729	.740	.750	.752	.751	.745	.738	.730
Philadelphia, Pa.....	29.977	.977	.977	.972	.971	.977	.985	.991	.999	.001	.987	.966	.950	.942	.945	.953	.964	.971	.982	.987	.992	.989	.989	.981	.976
Pittsburg, Pa.....	29.142	.142	.148	.142	.138	.140	.145	.153	.161	.170	.167	.148	.131	.118	.121	.126	.132	.141	.144	.149	.150	.150	.149	.147	.144
Portland, Oreg.....	29.932	.933	.932	.930	.928	.933	.932	.929	.933	.939	.943	.956	.967	.968	.955	.941	.929	.927	.928	.928	.925	.923	.921	.920	.935
St. Louis, Mo.....	29.508	.506	.512	.516	.515	.515	.520	.530	.541	.549	.558	.545	.526	.505	.493	.492	.495	.495	.496	.502	.508	.511	.515	.516	.515
St. Paul, Minn.....	29.132	.131	.133	.137	.132	.128	.126	.126	.130	.135	.143	.145	.131	.115	.104	.103	.110	.116	.119	.125	.125	.128	.128	.129	.126
Salt Lake City, Utah.	25.770	.772	.768	.766	.772	.772	.771	.773	.775	.779	.789	.802	.807	.788	.766	.757	.753	.753	.758	.758	.759	.758	.759	.761	.770
San Diego, Cal.....	29.967	.968	.964	.961	.958	.957	.952	.950	.956	.971	.982	.995	.003	.991	.961	.945	.932	.929	.931	.933	.943	.952	.958	.963	.959
San Francisco, Cal...	29.999	.001	.998	.994	.993	.993	.988	.983	.989	.994	.004	.015	.028	.023	.002	.985	.971	.971	.969	.967	.974	.976	.978	.985	.991
Santa Fe, N. Mex ...	29.271	.267	.261	.261	.261	.255	.251	.253	.259	.267	.279	.286	.276	.257	.244	.225	.225	.230	.237	.244	.250	.254	.261	.264	.255
Savannah, Ga.....	30.074	.075	.076	.073	.075	.080	.092	.103	.114	.122	.116	.095	.070	.055	.047	.048	.049	.052	.059	.062	.072	.075	.075	.072	.076
Washington, D. C....	29.991	.991	.992	.990	.993	.998	.006	.015	.024	.032	.020	.001	.970	.960	.964	.965	.974	.984	.993	.997	.998	.996	.000	.993	.994
West Indies.																									
Basseterre, St. Kitts.	29.884	.874	.867	.869	.877	.893	.919	.933	.938	.928	.910	.885	.870	.861	.860	.865	.874	.884	.899	.911	.915	.911	.904	.896	.893
Bridgetown, Bar.....	29.838	.830	.833	.838	.851	.863	.884	.896	.901	.887	.865	.843	.826	.818	.817	.824	.833	.844	.857	.866	.869	.868	.862	.852	.853
Cienfuegos, Cuba....	29.957	.951	.943	.940	.941	.951	.967	.980	.998	.000	.988	.968	.937	.918	.909	.909	.916	.928	.944	.960	.973	.979	.976	.969	.954
Havana, Cuba.....	29.986	.981	.974	.972	.972	.978	.990	.002	.021	.029	.023	.008	.981	.963	.953	.952	.954	.960	.970	.979	.995	.000	.001	.994	.985
Kingston, Jamaica..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port of Spain, Trin..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
P. Principe, Cuba ...	29.628	.617	.609	.608	.611	.621	.636	.635	.667	.670	.659	.639	.613	.597	.592	.591	.601	.613	.626	.638	.649	.654	.649	.639	.628
Roseau, Dominica ..	29.861	.851	.849	.851	.861	.873	.889	.909	.912	.905	.885	.865	.850	.840	.840	.845	.851	.860	.872	.882	.886	.885	.881	.874	.870
San Juan, P. R.....	29.857	.845	.840	.843	.848	.861	.878	.897	.905	.901	.886	.863	.845	.833	.828	.835	.842	.852	.864	.876	.882	.880	.875	.866	.863
Santiago de Cuba...	29.869	.859	.851	.853	.857	.867	.884	.893	.912	.910	.892	.865	.835	.819	.816	.818	.827	.837	.851	.868	.885	.888	.887	.878	.863
Santo Domingo, S. D.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Willemstad, Curaçao	29.779	.768	.762	.770	.782	.797	.822	.837	.839	.832	.809	.785	.752	.741	.732	.734	.742	.754	.778	.794	.806	.808	.804	.796	.784

TABLE V.—*Average wind movement for each hour of seventy-fifth meridian time, December, 1899.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex	8.7	8.6	9.0	9.5	9.1	8.7	8.3	8.4	8.1	8.2	9.7	10.2	10.3	10.9	11.1	11.3	11.4	11.0	9.0	7.3	6.9	7.6	8.7	8.8	9.2
Albany, N. Y	6.8	7.2	5.9	5.6	5.8	6.6	6.7	6.9	8.1	8.8	9.3	9.3	9.8	9.4	9.7	9.2	9.0	8.6	7.8	8.0	8.5	8.1	8.1	7.5	7.9
Alpena, Mich	11.1	10.7	11.6	12.3	11.6	11.0	11.7	11.7	11.6	11.9	12.5	14.0	13.9	13.9	12.8	12.5	12.2	10.7	11.2	11.3	11.7	11.5	11.5	11.1	11.9
Amarillo, Tex	6.3	5.9	5.8	5.3	5.5	5.4	5.5	5.1	4.8	4.9	5.9	6.8	8.2	8.5	8.8	8.6	8.2	7.5	6.4	5.8	5.7	6.0	6.1	6.4	6.4
Atlanta, Ga	13.6	13.3	13.4	12.9	12.6	12.4	12.6	12.5	12.2	13.1	12.7	12.3	12.5	11.9	12.1	11.5	11.2	11.1	11.8	11.6	12.2	12.7	13.7	13.6	12.5
Atlantic City, N. J	10.8	10.6	10.4	10.5	10.4	10.4	10.9	11.4	12.6	14.1	14.7	13.5	13.5	12.9	12.6	12.1	11.1	10.6	10.3	10.3	10.4	10.8	11.4	11.4	11.6
Augusta, Ga	5.5	6.3	6.3	6.2	6.2	6.0	5.7	5.7	6.5	7.3	7.6	7.9	9.1	9.6	9.6	9.3	8.1	7.2	5.8	5.8	5.7	6.2	6.3	6.1	6.9
Baker City, Oreg	5.4	5.3	5.8	5.8	5.6	6.4	6.4	6.2	6.4	6.5	6.6	6.1	6.2	5.6	4.8	4.6	4.6	4.2	3.4	3.7	4.5	4.9	5.6	4.9	5.4
Baltimore, Md	4.3	4.5	4.6	4.7	5.0	4.9	4.9	4.6	4.9	5.9	7.2	7.2	7.2	7.8	7.1	7.0	6.0	4.5	5.2	4.9	4.5	4.5	4.8	4.2	5.4
Bismarck, N. Dak	5.4	5.1	5.7	6.1	6.2	6.7	7.3	6.9	6.9	7.1	7.3	7.7	9.8	10.5	10.6	10.8	10.1	8.5	7.6	7.3	7.3	6.8	6.8	6.2	7.5
Block Island, R. I	18.3	18.1	17.9	17.8	17.9	17.9	16.8	17.2	17.2	17.4	18.4	18.7	19.7	19.2	20.2	19.6	18.6	18.5	18.0	19.5	18.4	19.2	18.9	18.3	18.4
Boise, Idaho	4.2	4.2	4.0	4.0	4.1	3.9	3.8	3.5	3.7	3.6	3.9	4.3	5.3	5.4	5.0	4.8	4.9	4.6	4.0	4.0	3.7	3.8	3.7	3.8	4.2
Boston, Mass	10.3	10.2	10.2	10.2	10.3	9.9	10.0	10.2	10.6	11.6	12.5	13.8	13.6	14.3	14.0	12.9	12.5	11.7	11.3	10.8	10.6	9.8	10.1	10.3	11.3
Buffalo, N. Y	17.5	19.0	18.4	17.1	17.1	16.7	16.3	17.3	18.6	19.1	19.1	19.4	20.5	21.8	22.6	22.7	22.5	21.0	21.3	21.4	20.7	20.0	19.6	18.4	19.5
Cairo, Ill	9.6	9.4	9.4	9.6	9.3	8.9	9.3	9.2	9.0	9.7	10.1	10.3	10.9	10.8	10.6	11.1	10.9	9.8	8.5	8.7	8.6	9.1	9.3	9.2	9.6
Cape Henry, Va	13.5	14.4	13.4	13.7	14.0	14.3	14.4	13.9	14.4	14.2	13.4	14.0	13.9	13.9	13.1	12.4	11.4	10.2	10.8	11.7	13.0	13.3	13.5	13.7	13.3
Carson City, Nev	5.1	5.8	5.5	5.7	5.2	6.2	5.0	4.9	5.5	6.1	5.6	5.7	6.2	6.3	7.3	7.5	8.0	8.2	8.5	7.5	6.3	5.6	5.5	5.4	6.2
Cedar City, Utah	4.5	4.7	5.1	4.6	4.7	4.5	5.0	4.3	4.8	4.7	3.7	2.7	3.5	4.5	5.2	5.4	5.7	5.3	4.8	4.5	5.0	5.0	4.6	4.8	4.7
Charleston, S. C	10.5	10.3	10.9	10.6	11.2	11.3	10.2	10.1	10.3	11.4	12.1	11.8	12.1	11.4	11.3	11.0	11.0	9.5	9.8	9.8	10.2	9.6	10.3	10.6	10.7
Charlotte, N. C	7.2	6.9	7.1	6.7	6.4	6.7	6.7	7.0	6.8	7.3	7.5	8.1	8.5	9.1	9.4	8.9	8.4	6.3	6.3	6.6	6.7	6.9	7.0	7.0	7.3
Chattanooga, Tenn	7.7	7.4	7.5	7.6	7.8	7.1	7.5	7.0	6.7	7.1	7.4	7.7	8.3	9.1	10.3	10.1	10.1	9.0	9.0	8.7	8.1	8.2	8.0	7.4	8.1
Cheyenne, Wyo	10.1	10.7	11.3	11.9	12.1	13.0	13.3	13.7	13.3	12.3	11.8	13.1	14.9	15.7	15.6	15.6	14.5	12.6	10.9	10.2	10.2	9.6	9.1	9.1	12.3
Chicago, Ill	17.6	18.2	18.3	18.6	18.8	18.8	18.8	18.9	18.9	19.2	19.0	18.2	18.8	18.9	19.5	19.7	18.2	16.8	17.6	18.1	17.8	18.6	18.4	18.1	18.5
Cincinnati, Ohio	8.3	8.3	8.2	8.1	7.8	8.5	9.0	8.7	8.9	10.1	11.3	11.5	11.8	11.7	11.7	11.1	10.4	9.0	8.4	8.4	8.4	8.9	8.7	8.5	9.4
Cleveland, Ohio	17.3	17.4	17.3	17.2	17.9	17.6	18.8	19.4	19.6	19.9	20.5	20.8	20.7	20.7	19.3	19.4	18.8	17.7	18.2	18.6	18.3	18.9	18.0	17.2	18.7
Columbia, Mo	8.9	8.6	8.6	8.4	9.0	8.1	8.1	7.9	7.4	7.7	8.3	8.5	8.8	9.0	8.6	8.7	9.2	8.5	8.4	8.3	8.8	8.8	9.6	9.6	8.6
Columbus, Ohio	7.7	8.4	8.1	7.9	8.3	8.3	8.6	9.1	9.5	10.9	11.2	11.0	11.6	11.6	11.2	10.2	9.6	8.9	8.4	7.8	7.7	7.6	7.7	7.6	9.1
Concordia, Kans	6.1	5.4	5.6	5.9	6.0	5.7	6.0	6.1	6.5	7.1	7.8	8.0	8.2	8.3	8.1	8.2	7.8	6.2	6.3	6.4	6.9	7.4	7.2	6.9	6.8
Corpus Christi, Tex	10.1	10.2	9.8	9.3	9.0	8.6	9.1	9.2	9.5	10.7	10.9	11.4	11.7	12.2	12.8	12.7	12.7	11.2	10.5	9.6	9.8	10.4	10.0	9.8	10.5
Davenport, Iowa	7.7	7.9	8.2	8.0	7.7	7.6	8.0	8.1	8.0	8.7	9.3	9.2	10.2	10.1	10.3	10.1	10.0	8.9	8.4	8.1	7.7	7.6	7.8	7.4	8.5
Denver, Colo	8.3	7.9	8.2	7.9	8.8	9.7	9.4	9.7	9.5	10.2	11.3	10.0	9.8	10.0	9.0	9.2	9.7	8.6	8.6	8.9	8.4	8.7	9.1	8.3	9.1
Des Moines, Iowa	7.5	7.6	7.1	6.7	6.8	6.7	6.9	6.7	6.9	7.5	8.6	8.6	8.8	9.5	9.5	9.2	8.9	8.1	7.4	7.7	7.9	8.0	8.0	7.8	7.9
Detroit, Mich	11.0	11.0	10.3	10.4	11.5	11.9	12.0	12.7	13.5	14.2	16.0	15.9	16.5	15.7	15.1	14.1	13.5	12.1	11.3	11.3	11.1	10.8	10.4	10.6	12.6
Dodge, Kans	8.0	7.7	7.3	7.2	7.3	7.6	7.8	7.6	7.9	8.2	9.9	10.4	10.5	11.6	11.7	11.2	10.6	9.4	8.1	7.8	8.1	8.3	8.6	8.2	8.8
Dubuque, Iowa	8.9	8.6	9.1	8.0	8.1	8.1	7.6	7.4	7.3	7.7	9.3	9.6	9.6	10.0	9.7	10.0	9.6	8.9	8.2	8.5	8.6	8.2	8.8	8.7	8.7
Duluth, Minn	11.1	9.8	9.6	9.6	8.8	8.6	9.5	9.5	9.4	10.1	11.1	11.4	11.7	10.8	11.5	11.4	10.9	10.1	10.6	11.4	11.6	12.6	11.0	11.1	10.6
Eastport, Me	11.9	11.8	12.0	12.4	12.6	12.6	13.3	14.0	14.3	14.3	14.0	14.3	14.3	14.1	14.2	13.4	12.9	12.9	13.1	12.6	13.1	12.2	11.9	11.5	13.1
Elkins, W. Va	5.4	5.3	5.4	5.3	5.0	4.8	4.7	5.1	5.4	5.9	7.4	8.0	8.1	8.4	7.5	7.9	6.8	5.3	5.0	4.6	5.1	5.2	5.3	6.0	6.0
El Paso, Tex	10.5	10.5	10.8	10.4	10.5	10.4	10.6	10.4	10.4	10.7	10.0	10.3	11.3	11.2	11.1	12.3	11.9	11.4	10.1	9.3	9.5	9.5	9.2	10.0	10.5
Erie, Pa	16.2	15.0	15.0	14.9	14.8	15.3	15.4	15.7	16.3	16.3	16.8	16.3	16.7	16.7	16.4	16.2	15.2	15.3	14.5	14.7	14.8	15.6	16.0	16.2	15.7
Escanaba, Mich	10.5	10.2	10.2	10.1	9.9	9.1	9.2	9.2	9.5	10.6	12.0	12.5	13.0	13.2	13.4	12.9	12.0	11.2	10.6	10.7	10.8	10.5	10.8	10.7	11.0
Eureka, Cal	4.2	4.2	4.3	4.5	4.7	4.6	5.2	4.8	4.6	4.4	5.1	5.1	4.6	4.6	5.4	6.2	6.5	6.6	6.1	5.8	5.3	4.8	4.5	4.7	5.0
Evansville, Ind	7.7	7.7	7.7	7.6	8.3	8.5	8.0	7.6	7.9	8.5	9.7	9.8	10.3	10.1	10.0	9.8	9.4	8.5	8.1	8.4	8.4	8.8	9.1	8.1	8.7
Fort Canby, Wash	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Fort Smith, Ark	8.5	8.1	8.1	8.3	8.8	8.1	84.	8.4	8.5	8.5	7.9	7.5	8.3	8.5	8.7	8.4	8.8	8.4	7.6	7.4	6.8	6.7	7.4	7.7	8.1
Fresno, Cal	3.6	4.0	3.8	3.8	3.6	3.5	3.3	3.4	3.5	3.5	3.5	3.9	4.0	4.5	5.0	4.6	4.8	4.3	4.5	3.9	3.9	3.6	3.9	3.9	3.9
Galveston, Tex	10.6	11.1	10.7	10.8	10.1	10.3	9.8	10.4	10.9	11.8	11.8	12.0	11.8	11.6	11.8	12.0	11.5	11.6	10.7	10.5	10.6	11.0	11.3	10.7	11.1
Grand Haven, Mich	12.5	12.9	12.9	13.1	13.7	13.9	14.0	13.5	13.3	14.0	14.7	14.3	14.4	14.9	15.3	14.7	14.4	13.4	13.3	13.5	13.4	13.3	13.2	12.9	13.7
Grand Junction, Colo	3.3	3.5	3.0	3.2	3.3	3.2	3.5	3.3	3.3	3.5	3.8	4.5	4.6	4.5	4.4	4.3	4.1	3.8	3.5	2.8	2.9	3.0	2.9	2.9	3.5
Green Bay, Wis	8.8	8.8	8.8	9.3	9.3	9.3	9.1	9.7	10.0	11.1	12.1	11.7	12.0	13.0	12.6	12.6	11.5	9.5	9.2	9.1	9.5	9.7	9.6	9.4	10.2
Hannibal, Mo	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Harrisburg, Pa	7.1	7.3	7.5	8.1	7.8	8.6	8.5	8.2	8.1	9.5	10.8	11.5	12.2	12.2	11.9	11.0	9.8	9.1	8.9	8.4	7.5	7.5	7.2	7.2	9.0
Hatteras, N. C	13.4	13.9	14.2	14.8	15.6	14.6	14.4	14.7	14.1	14.6	15.1	14.5	14.2	14.2	13.7	14.1	13.8	13.7	13.2	13.6	14.1	13.7	14.0	13.8	14.2
Havre, Mont	12.7	12.0	12.2	11.9	10.5	9.9	10.0	10.2	11.3	10.9	10.7	11.1	12.5	13.3	13.5	13.5	12.8	12.2	11.3	11.8	12.0	13.1	12.2	12.0	11.8
Helena, Mont	6.5	5.8	6.8	6.1	6.5	5.2	6.2	5.0	4.9	5.1	5.1	5.6	5.9	6.7	7.6	7.7	7.3	7.1	7.5	7.5	7.8	7.9	8.0	7.0	6.5
Huron, S. Dak	9.5	9.1	8.5	8.6	7.5	7.7	8.0	7.5	7.9	7.8	8.6	9.6	11.0	11.6	12.4	12.4	11.6	9.9	8.9	9.5	10.0	9.8	9.6	9.6	9.4
Independence, Cal	7.9	8.4	8.5	8.8	8.5	8.0	8.2	9.1	8.5	9.4	8.4	8.0	8.2	8.3	8.5	8.6	9.0	9.0	8.3	8.3	7.9	6.2	7.1	7.4	8.3
Indianapolis, Ind	12.4	12.2	12.7	12.5	12.7	12.5	12.0	12.1	12.8	13.1	13.6	13.7	14.6	14.0	13.9	13.6	13.2	12.0	11.7	11.3	11.7	12.3	12.6	12.2	12.7
Jacksonville, Fla	6.3	6.6	6.5	7.0	6.4	6.5	6.8	6.6	7.1	8.3	9.2	10.0	10.6	10.3	10.6	10.0	9.5	8.1	7.6	7.5	7.5	7.4	7.0	7.1	7.9
Jupiter, Fla	10.8	10.8	10.6	10.5	10.6	10.2	10.4	10.5	11.3	12.2	12.4	12.6	12.9	13.5	13.4	13.1	12.1	10.7	9.9	10.2	10.9	11.4	11.2	11.3	11.4
Kalispell, Mont	5.3	4.7	4.3	4.5	4.3	4.3	4.7	4.0	4.2	4.3	4.5	4.3	4.4	4.4	4.2	3.9	4.3	4.5	4.4	4.4	4.4	4.9	5.2	5.0	4.5
Kansas City, Mo	8.9	9.3	8.6	8.2	8.2	7.6	7.1	7.4	7.9	8.1	8.4	8.2	8.8	8.9	9.9	9.4	8.8	8.0	7.7	7.9	8.6	8.5	8.5	8.6	8.4
Keokuk, Iowa	8.6	9.0	8.6	8.6	8.5	8.4	8.4	7.9	7.9	8.0	8.6	9.1	9.4	10.1	10.1	9.9	9.9	8.7	8.8	8.5	8.3	8.0	8.5	8.0	8.7
Key West, Fla	12.6	12.9	12.8	12.9	13.0	12.7	13.2	13.3	13.8	14.1	13.8	13.6	13.7	13.5	13.7	13.4	13.0	12.2	12.1	12.3	11.8	11.9	11.9	12.0	12.9
Kittyhawk, N. C	13.1	13.5	13.6	13.6	14.1	14.5	14.6	14.9	15.5	16.0	15.6	15.3	14.5	15.7	14.9	13.3	12.4	11.9	11.3	11.4	11.5	13.3	13.1	13.4	13.8
Knoxville, Tenn	7.0	7.0	6.8	7.2	7.4	7.7	7.4	7.9	7.9	7.6	8.1	8.4	8.4	10.1	9.8	10.4	9.5	8.5	8.4	8.4	7.8	7.1	7.9	7.3	8.1
La Crosse, Wis	7.8	8.1	7.6	7.7	7.4	7.4	7.5	7.3	7.4	6.7	7.7	8.8	9.5	8.9	8.8	8.5	8.4	8.1	8.3	7.7	8.2	7.8	8.4	7.7	8.0
Lander, Wyo	3.2	2.7	2.7	2.6	2.8	2.8	2.7	2.5	2.4	2.6	2.0	2.2	2.7	3.2	3.9	3.9	4.1	3.8	3.5	3.9	3.7	2.8	2.9	2.6	3.0
Lexington, Ky	12.4	12.3	11.9	12.0	11.8	11.5	11.2	11.7	11.7	12.1	13.1	13.1	14.1	13.7	13.4	12.6	11.9	11.1	11.2	11.6	12.0	12.3	12.7	12.1	12.2
Little Rock, Ark	6.6	7.1	7.4	8.1	8.1	8.1	8.3	8.5	8.7	9.4	10.0	10.1	9.6	9.5	10.4	10.3	9.4	8.0	6.8	6.7	6.7	6.2	6.7	6.7	8.2
Los Angeles, Cal	2.4	3.0	2.7	3.1	2.9	3.0	3.4	3.2	3.3	3.5	3.4	3.6	3.6	3.8	3.7	4.4	4.8	4.9	5.2	3.7	2.8	2.3	2.3	2.3	3.4
Louisville, Ky	9.0	8.4	8.7	8.5	9.0	9.3	8.6	8.5	8.4	9.5	10.7	11.2	11.7	11.4	11.1	10.9	10.3	10.2	9.7	9.6	9.1	9.3	9.3	9.9	9.7
Lynchburg, Va	4.0	3.7	3.4	3.6	3.3	3.5	3.5	3.3	3.7	4.7	6.1	6.5	7.1	7.1	6.8	6.3	5.7	4.3	3.9	3.8	3.5	3.6	3.7	3.5	4.5
Macon, Ga	7.3	7.3	7.2	7.4	6.5	6.2	6.1	6.7	7.0	7.7	7.8	8.4	8.9	9.3	8.7	8.3	7.3	6.1	5.7	6.0	6.0	5.8	5.9	6.7	7.1
Marquette, Mich	12.6	12.4	11.7	11.8	11.3	11.8	11.6	12.5	11.8	12.5	13.4	13.6	13.8	13.7	13.4	13.1	11.9	11.5	12.1	13.5	13.8	14.2	14.3	14.5	12.8
Memphis, Tenn	11.4	11.5	11.5	10.8	11.0	11.1	11.5	12.0	12.0	12.3	12.9	12.5	12.6	12.4	12.3	12.8	12.2	11.3	10.5	10.8	11.0	11.5	11.4	11.3	11.7
Milwaukee, Wis	12.1	11.9	11.6	11.4	11.4	11.1	11.9	11.7	12.4	12.8	13.6	13.5	13.4	13.6	13.6	13.7	13.0	11.9	12.3	12.5	12.0	12.1	11.7	12.2	12.4
Minneapolis, Minn	12.4	12.0	12.1	12.1	12.4	13.0	12.7	12.7	12.5	12.5	13.4	13.0	13.5	13.7	13.8	14.0	14.1	13.3	13.6	13.3	14.1	13.6	12.9	13.0	13.1
Mobile, Ala	8.4	7.5	7.2	7.0	7.0	7.1	7.1	6.4	6.6	7.0	7.7	7.9	8.8	9.5	9.9	10.3	9.8	8.9	8.5	7.8	8.1	8.0	8.0	8.5	8.0
Montgomery, Ala	6.4	5.5	5.9	5.8	5.7	6.0	5.7	5.6	5.7	6.7	7.2	7.3	7.6	8.1	8.2	7.7	7.4	6.5	6.9	6.6	7.1	7.5	6.9	6.2	6.7
Minneapolis, Minn	10.1	9.8	10.1	9.6	9.4	9.5	9.0	9.1	8.7	8.5	9.3	10.3	10.3	10.9	11.5	11.3	11.4	10.4	9.5	10.4	10.8	10.5	10.5	10.6	10.1
Mount Tamalpais, Cal	25.0	23.7	24.9	24.9	24.5	25.1	25.8	25.4	24.9	24.9	24.4	25.7	24.9	22.2	21.5	21.1	20.7	22.1	22.8	23.0	24.5	24.4	23.4	23.9	23.9
Nantucket, Mass	11.8	11.5	11.5	11.7	11.5	12.0	11.3	11.1	11.3	12.6	13.1	13.4	13.3	14.1	13.4	12.8	11.1	11.2	11.2	11.8	12.4	11.3	11.6	11.8	12.0
Nashville, Tenn	6.8	6.5	6.5	5.5	5.5	5.4	5.8	6.4	7.6	7.9	9.6	10.0	10.5	10.3	10.2	9.8	9.7	8.5	8.0	8.4	7.9	7.4	7.0	7.2	7.9
Neah, Wash	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......

TABLE V.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
New Haven, Conn.	8.1	7.5	7.2	7.1	6.9	7.3	7.0	7.0	8.7	10.9	11.9	12.4	13.4	12.8	12.4	11.6	9.6	8.6	8.6	8.2	8.0	7.5	7.5	7.8	9.1
New Orleans, La.	9.1	9.1	9.3	9.1	8.7	9.0	9.0	9.4	9.0	8.9	9.5	9.2	10.7	10.3	10.4	10.2	9.9	9.5	9.4	9.2	10.0	8.6	9.0	9.0	9.4
New York, N. Y.	15.9	15.4	14.1	14.8	15.0	15.3	16.8	16.6	17.8	19.1	20.0	19.7	20.1	20.3	19.1	19.0	19.4	17.8	16.9	16.3	16.5	16.2	16.5	16.0	17.3
Norfolk, Va.	8.2	7.9	8.2	8.4	8.7	8.8	9.0	8.9	9.8	10.8	10.9	11.0	10.9	11.2	11.3	10.6	9.8	8.1	8.2	8.2	8.1	8.4	8.2	8.0	9.2
Northfield, Vt.	9.1	9.6	8.8	8.5	8.5	8.1	7.5	8.2	9.0	9.7	10.5	9.9	10.7	11.4	10.7	9.5	8.1	8.9	9.4	9.2	9.9	9.4	10.5	9.1	9.3
North Platte, Nebr.	5.5	4.9	5.4	5.5	6.1	6.1	6.3	6.0	6.0	6.2	7.3	8.2	9.1	11.7	11.6	11.2	10.5	9.2	7.5	6.7	6.5	6.5	6.1	5.2	7.3
Oklahoma, Okla.	10.4	10.4	10.7	10.9	10.5	10.4	10.3	10.1	10.5	11.1	12.1	12.8	12.7	14.4	14.1	13.5	13.1	10.9	9.8	9.3	10.1	10.9	10.5	10.8	11.2
Omaha, Nebr.	7.7	8.2	8.8	8.7	8.4	8.6	7.9	8.1	8.6	9.4	9.5	9.2	9.8	10.1	9.9	10.2	10.6	9.7	9.0	9.2	9.8	9.5	9.3	8.6	9.1
Oswego, N. Y.	14.6	14.4	14.0	13.5	13.9	13.8	13.6	13.0	13.3	13.8	14.3	14.2	14.7	13.4	13.5	13.5	13.0	13.3	13.9	14.4	14.5	14.7	14.7	14.5	13.9
Palestine, Tex.	6.4	6.8	6.3	7.1	7.0	7.5	7.3	7.2	7.3	7.6	8.3	9.1	9.4	9.2	9.4	8.9	8.9	8.3	6.7	6.1	6.2	5.8	6.5	6.5	7.5
Parkersburg, W. Va.	5.2	6.2	6.5	6.1	6.3	6.0	6.2	6.3	6.5	7.6	8.8	8.9	9.4	9.7	9.5	8.8	8.5	7.2	6.6	5.5	5.5	5.6	5.6	5.2	7.0
Pensacola, Fla.	10.7	10.6	10.1	10.0	10.3	10.8	11.4	10.9	11.1	12.0	11.7	11.0	11.2	11.8	11.3	11.1	13.1	10.9	9.8	9.2	10.8	10.9	10.8	11.2	10.9
Phenix, Ariz.	3.1	3.0	3.0	3.1	3.3	3.5	3.7	3.3	3.3	2.9	2.8	3.2	3.9	4.2	4.4	4.0	4.0	3.5	3.2	2.9	2.9	2.2	3.0	2.9	3.3
Philadelphia, Pa.	8.6	8.6	8.1	9.0	9.2	9.4	9.8	10.8	11.1	12.5	13.0	12.9	12.7	12.3	11.7	10.9	10.7	9.5	8.7	8.8	9.5	9.2	8.6	8.8	10.2
Pierre, S. Dak.	5.3	4.8	4.8	5.7	5.6	5.5	5.5	5.6	6.1	7.0	7.6	10.1	11.3	11.4	11.5	11.1	10.8	9.2	7.2	7.0	7.5	7.1	6.9	5.9	7.5
Pittsburg, Pa.	6.9	6.6	6.7	6.5	6.5	6.3	6.2	6.5	7.0	7.7	8.6	8.7	8.8	8.3	8.9	8.5	8.2	8.2	6.8	6.7	6.4	6.3	7.0	7.1	7.3
Pocatello, Idaho	11.6	11.0	10.6	10.2	10.2	10.4	10.3	9.5	9.8	11.4	10.3	10.7	11.4	11.4	10.8	12.5	12.4	11.5	10.7	11.3	10.2	10.8	11.5	11.6	11.0
Point Reyes Lt., Cal.	12.2	12.3	12.0	12.1	11.6	11.2	10.8	11.4	12.1	11.1	11.3	12.1	12.2	10.9	10.8	12.0	12.3	12.2	12.9	13.8	13.5	14.2	13.0	13.1	12.1
Port Crescent, Wash.	2.8	3.1	3.0	2.8	2.9	3.1	3.0	3.6	3.4	3.6	3.5	3.1	3.4	3.7	3.9	4.1	4.4	4.4	4.1	3.8	3.3	3.0	3.1	3.2	3.4
Port Huron, Mich.	10.6	11.0	11.2	11.1	11.0	11.7	12.6	12.6	13.5	14.7	16.4	17.4	17.2	16.6	15.8	15.0	14.4	12.3	12.3	12.1	11.7	11.5	11.4	10.9	13.1
Portland, Me.	7.7	7.4	8.0	8.2	7.7	7.4	7.4	7.3	7.8	8.2	9.0	8.5	8.8	9.3	8.7	9.0	8.4	7.5	7.5	7.3	7.1	7.5	7.7	8.2	8.0
Portland, Oreg.	8.7	9.7	9.7	9.2	9.9	9.5	9.2	8.7	8.2	8.2	7.9	7.5	7.8	7.5	9.3	9.3	9.1	8.3	9.0	8.7	7.5	6.9	7.8	7.5	8.5
Pueblo, Colo.	6.6	6.5	6.2	5.4	5.1	4.9	4.7	5.0	5.4	5.3	5.3	6.7	8.7	9.3	8.0	8.2	7.9	7.4	7.2	6.4	5.7	4.5	5.7	6.1	6.3
Raleigh, N. C.	5.6	5.8	6.3	6.8	6.5	6.1	5.5	6.0	6.6	7.5	8.0	7.5	7.9	8.1	7.5	7.6	6.1	4.8	4.7	5.1	5.2	5.1	6.2	5.9	6.3
Rapid City, S. Dak.	5.6	5.6	5.8	5.6	5.2	5.8	6.4	7.2	7.5	7.4	6.8	7.4	6.9	7.7	7.8	7.5	6.8	6.0	5.1	5.6	6.0	5.9	5.5	5.8	6.4
Red Bluff, Cal.	4.2	4.4	4.8	4.8	5.0	4.7	4.5	4.5	4.1	4.4	4.8	4.8	5.0	6.1	7.3	7.3	7.0	6.4	5.8	5.3	5.5	5.5	4.7	4.7	5.2
Richmond, Va.	5.8	5.7	5.4	5.1	4.9	4.9	5.2	5.4	6.1	6.4	7.9	8.4	8.6	9.0	8.7	8.5	7.2	6.5	5.6	5.5	5.3	5.2	5.2	5.4	6.3
Rochester, N. Y.	8.3	8.0	8.3	8.8	8.8	8.0	7.7	7.7	7.9	8.5	9.2	9.9	10.9	10.6	10.6	9.4	9.3	9.6	9.7	9.6	10.2	9.7	9.4	9.3	9.1
Roseburg, Oreg.	2.9	2.7	2.9	2.6	2.4	3.1	2.7	3.0	3.3	2.8	2.7	2.5	2.5	2.8	3.3	3.4	3.4	3.6	3.4	2.5	2.7	2.8	2.5	2.7	2.9
Sacramento, Cal.	7.7	7.6	7.5	7.5	7.4	6.8	6.5	6.6	6.5	6.5	6.2	6.2	6.3	6.9	7.5	8.4	8.6	8.1	7.6	7.7	7.4	7.7	7.2	7.8	7.3
St. Louis, Mo.	11.0	10.5	10.6	10 6	11.1	10.8	10.5	10.1	10.7	10.6	11.2	11.3	12.1	11.9	11.6	11.6	11.5	11.1	10.7	10.9	11.2	11.8	12.1	11.4	11.1
St. Paul, Minn.	8.7	8.3	8.3	8.3	8.6	9.2	8.8	9.1	9.1	9.4	10.1	10.5	11.0	11.2	11.4	11.2	9.8	9.3	9.3	9.5	9.5	10.0	9.3	8.6	9.6
Salt Lake City, Utah	3.3	3.4	3.5	3.5	3.2	3.0	3.7	3.3	2.9	3.2	3.1	3.0	3.8	4.2	4.5	4.9	5.5	5.3	5.3	3.8	3.1	3.4	3.2	3.2	3.7
San Antonio, Tex.	7.4	7.4	7.5	7.8	8.7	8.9	8.6	8.8	9.0	8.6	8.9	9.8	10.7	10.6	11.0	11.0	10.7	9.1	8.2	8.4	7.7	7.7	7.2	7.9	9.0
San Diego, Cal.	2.9	3.0	3.9	4.0	3.8	4.0	3.9	3.7	3.9	4.2	3.5	3.0	3.0	3.5	4.7	6.1	7.5	8.2	7.0	5.4	4.2	3.4	3.1	3.4	4.3
Sandusky, Ohio	8.7	8.3	8.1	9.2	9.1	9.0	9.4	9.8	9.9	10.6	11.4	12.1	12.7	12.2	11.8	11.6	10.5	10.0	9.1	9.3	9.3	9.0	9.0	8.9	10.0
Sandy Hook, N. J.	17.5	18.5	18.0	19.2	18.9	19.1	20.5	20.8	20.5	20.3	20.3	21.7	20.4	19.9	19.0	19.2	19 0	19.1	18.4	18.6	18.8	19.2	18.7	18.1	19.3
San Francisco, Cal.	7.9	8.6	8.8	7.8	7.9	7.9	8.6	8.9	8.7	8.5	8.4	8.2	8.8	8.7	8.8	9.7	10.6	9.5	9.0	8.9	8.8	8.2	8.0	8.1	8.6
San Luis Obispo, Cal.	3.7	3.9	3.5	3.9	4.3	4.5	4.3	4.6	4.7	3.8	4.2	4.0	4.5	5.4	6.2	7.5	7.3	6.9	6.6	5.8	4.9	4.5	4.5	4.2	4.5
Santa Fe, N. Mex.	4.3	4.6	4.9	4.8	4.9	5.1	5.5	6.0	6.1	6.6	6.5	8.2	9.4	9.4	9.0	8.7	8.8	8.2	6.0	4.4	4.5	4.5	4.2	4.2	6.2
Sault Ste. Marie, Mich	10.5	10.1	10.2	9.7	9.4	8.8	8.2	8.5	8.2	8.4	8.7	9.5	9.8	9.8	10.5	10.2	10.6	10.2	10.1	11.0	11.7	11.4	10.5	10.5	9.9
Savannah, Ga.	8.1	7.8	7.3	7.4	7.7	7.6	7.7	7.8	7.6	8.0	8.9	8.7	9.8	9.8	9.7	9.3	8.9	7.4	7.4	7.2	7.5	7.8	8.0	8.7	8.1
Seattle, Wash.	6.5	6.3	6.4	6.5	6.6	6.6	6.4	6.3	6.3	6.1	6.7	6.8	7.1	6.5	6.9	6.4	7.1	6.7	7.1	6.6	6.7	6.2	6.7	6.6	6.6
Shreveport, La.	7.8	7.0	6.9	7.3	7.5	7.0	7.4	7.5	6.8	7.7	8.9	8.5	8.8	8.3	8.5	8.5	9.0	8.3	7.4	7.2	7.3	7.6	8.0	7.6	7.8
Sioux City, Iowa	11.1	10.9	10.8	10.2	10.2	10.0	10.0	11.0	10.4	10.2	10.9	11.0	12.0	12.8	13.5	13.7	13.3	12.5	12.7	12.3	12.0	11.9	11.2	10.7	11.4
Spokane, Wash.	6.0	5.1	4.9	4.3	4.5	5.0	4.8	5.2	5.4	5.9	5.9	5.9	6.2	6.3	6.3	6.3	6.2	6.0	5.4	5.6	5.1	4.8	5.0	5.5	5.5
Springfield, Ill.	11.2	11.0	11.1	11.2	10.9	10.3	10.2	10.6	10.5	11.0	11.5	11.1	12.1	11.8	11.8	11.7	10.4	9.4	9.4	9.7	10.9	10.9	11.2	11.4	10.9
Springfield, Mo.	11.7	11.2	10.8	11.2	11.0	11.3	10.6	10.4	11.0	10.6	10.6	10.9	11.1	10.9	11.4	10.8	10.2	9.4	8.9	9.9	10.3	10.9	11.5	12.0	10.8
Tacoma, Wash.	7.0	6.4	6.2	6.4	6.8	6.6	6.9	6.4	6.2	5.7	6.0	6.5	6.6	6.5	6.5	7.2	7.6	6.6	6.6	6.5	6.8	6.2	6.3	6.8	6.5
Tampa, Fla.	5.4	5.2	5.4	5.1	5.4	5.4	5.5	5.8	6.4	8.0	8.5	8.8	8.6	9.2	9.3	8.9	8.5	6.5	6.5	7.1	7.1	6.8	7.1	6.6	6.9
Toledo, Ohio	9.6	9.7	9.8	10.4	11.0	11.6	11.5	11.6	12.5	13.3	13.8	14.6	15.3	14.7	14.7	13.7	12.1	10.9	10.1	10.5	10.0	9.9	9.6	9.6	11.7
Vicksburg, Miss.	8.2	8.3	8.3	8.5	8.7	8.0	7.8	7.4	8.1	8.2	9.5	9.1	9.3	9.8	9.7	9.7	9.0	7.9	7.4	7.0	7.1	7.7	8.5	8.3	8.4
Vineyard Haven, Mass	8.7	8.9	8.9	9.5	9.5	9.4	9.1	9.0	9.5	10.2	11.0	11.1	11.7	11.8	11.6	10.5	9 6	9.1	9.8	9.1	9.3	9.2	9.4	9.0	9.8
Walla Walla, Wash.	4.9	5.0	4.9	4.9	4.5	3.9	5.0	5.6	5.5	5.5	5.6	5.1	5.5	6.3	6.5	6.5	6.1	5.7	4.8	5.2	4.7	5.1	5.4	4.6	5.3
Washington, D. C.	5.4	5.4	5.6	6.4	6.0	5.7	5.6	5.4	6.2	7.7	9.6	9.8	10.4	10.3	10.6	10.1	8.6	6.9	6.3	6.4	6.1	6.0	6.0	6.1	7.2
Wichita, Kans.	8.1	8.1	7.7	7.6	7.5	7.1	7.4	7.4	7.1	7.3	8.7	9.1	10.1	9.8	9.8	10.3	10.3	8.9	8.5	8.5	8.6	8.5	8.8	8.2	8.5
Williston, N. Dak.	6.3	6.4	8.0	7.9	8.3	8.1	6.8	7.1	7.5	7.0	7.6	8.1	9.6	9.9	10.5	10.2	9.5	7.8	6.6	6.6	7.1	7.0	6.9	6.5	7.8
Wilmington, N. C.	7.0	7.3	6.9	7.5	8.0	7.7	7.9	8.1	8.2	8.6	9.6	9.9	11.0	11.2	11.1	9.6	7.9	6.7	6.7	6.6	6.5	6.5	6.2	6.1	8.0
Winnemucca, Nev.	7.4	7.3	7.5	8.1	8.7	8.7	8.9	8.5	8.1	8.8	8.8	8.5	9.8	10.4	10.5	10.5	9.9	9.7	8.8	8.5	8.0	8.1	6.8	7.1	8.6
Woods Hole, Mass.	16.3	16.6	16.5	17.0	17.2	17.0	16.7	15.8	16.7	16.1	16.4	16.7	16.8	16.7	17.5	16.5	16.0	15 9	16.8	16.6	16.6	16.1	16.5	16.7	16.6
Yankton, S. Dak.	7.2	7.7	7.6	7.5	6.7	6.5	6.6	6.7	6.7	6.4	7.4	8.5	9.3	9.9	10.3	10.5	10.3	9.7	8.2	8.4	7.9	7.5	7.9	7.4	8.0
West Indies.																									
Basseterre, St. Kitts	7.3	7.5	7.5	7.8	7.4	7.5	7.6	8.6	10.1	10.5	10.4	10.1	9.7	9.9	9.5	8.3	7.3	7.0	7.0	7.3	7.5	7.8	7.6	7.5	8.3
Bridgetown, Bar.	3.4	3.3	3.5	3.8	3.9	3.5	3.9	7.0	9.0	9.1	9.5	9.3	9.5	8.9	8.7	7.5	5.7	3.5	3.6	3.7	3.6	3.8	3.5	3.6	5.6
Cienfuegos, Cuba	5.7	5.3	5.4	5.8	5.6	5.1	4.7	5.0	5.8	7.8	10.3	10.2	10.1	10.2	9.8	9.7	9.7	7.8	6.8	6.5	6.5	6.2	6.4	5.8	7.2
Havana, Cuba	6.9	6.9	6.9	6.7	7.0	7.3	7.6	7.1	8.2	11.2	13.6	13.8	14.6	15.7	16.6	16.7	16.7	14.0	11.5	10.3	9.6	8.8	8.6	8.0	10.6
Kingston, Jamaica																									
Port of Spain, Trin.	1.3	1.5	1.5	1.4	1.5	1.3	1.4	2.8	4.8	5.4	5.8	6.6	7.1	6.3	5.8	4.6	4.0	2.9	2.4	2.2	1.8	1.6	1.7	1.5	3.2
Puerto Principe, Cuba	3.9	4.1	4.4	4.3	4.5	4.4	4.0	4.7	6.9	9.7	11.6	11.4	10.9	10.9	11.0	10.9	9.8	7.2	6.0	5.7	5.2	5.2	5.0	4.5	6.9
Roseau, Dominica	5.0	5.5	5.3	5.1	5.2	5.1	4.3	3.3	4.3	5.2	6.2	6.1	6.0	5.5	5.3	4.7	4.6	5.5	5.4	5.5	5.6	5.4	5.2	5.4	5.2
San Juan, Puerto Rico	9.0	8.5	8.5	8.5	8.0	8.1	8.7	9.2	10.3	11.1	11.7	11.7	11.8	12.4	11.9	11.6	11.0	10.7	10.3	10.1	9.7	8.9	8.8	9.1	10.0
Santiago de Cuba	4.9	4.7	4.7	4.7	4.8	4.4	4.5	5.1	6.5	8.0	8.8	8.8	8.9	8.5	8.1	7.8	7.1	6.0	5.5	5.7	5.7	5.5	5.6	5.3	6.2
Santo Domingo, S. D.																									
Willemstad, Curaçao.	8.1	8.1	7.7	7.8	7.8	7.8	7.7	9.8	11.4	11.9	12.3	12.5	12.5	12.5	12.3	11.2	10.3	9.8	9.2	9.2	9.0	9.2	8.7	8.5	9.8

TABLE VI.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during the month of December, 1899.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	23	13	10	27	n. 60 w.	20
Portland, Me	21	18	6	32	n. 83 w.	26
Northfield, Vt	8	47	1	13	s. 17 w.	41
Boston, Mass	11	26	7	32	s. 59 w.	29
Nantucket, Mass	23	19	9	28	n 78 w.	19
Woods Hole, Mass	20	16	12	25	n. 73 w.	14
Block Island, R. I	17	14	8	36	n. 84 w.	28
New Haven, Conn	26	12	8	31	n. 59 w.	27
Middle Atlantic States.						
Albany, N. Y	16	29	4	20	s. 51 w.	21
Binghamton, N. Y.†	5	9	2	21	s. 78 w.	19
New York, N. Y	25	14	10	29	n. 60 w.	22
Harrisburg, Pa.†	9	9	8	15	w.	7
Philadelphia, Pa	22	15	11	29	n. 69 w.	19
Atlantic City, N. J	24	12	4	32	n. 67 w.	30
Cape May, N. J	23	15	8	30	n. 70 w.	23
Baltimore, Md	13	15	16	30	s. 82 w.	14
Washington, D. C	17	21	10	25	s. 75 w.	16
Lynchburg, Va	10	21	13	31	s. 59 w.	21
Norfolk, Va	26	16	14	19	n. 27 w.	11
Richmond, Va	20	22	13	20	s. 74 w.	7
South Atlantic States.						
Charlotte, N. C	24	19	19	17	n. 22 e.	5
Hatteras, N. C	33	9	8	22	n. 30 w.	28
Raleigh, N. C	28	14	11	26	n. 47 w.	20
Wilmington, N. C	27	14	14	25	n. 40 w.	17
Charleston, S. C	30	12	13	21	n. 24 w.	20
Augusta, Ga	23	7	10	31	n 53 w.	26
Savannah, Ga	27	13	15	19	n. 16 w.	15
Jacksonville, Fla	33	9	22	16	n. 14 e.	25
Florida Peninsula.						
Jupiter, Fla	18	14	25	19	n. 56 e.	7
Key West, Fla	28	5	37	8	n. 52 e.	37
Tampa, Fla	37	7	26	12	n. 25 e.	33
Eastern Gulf States.						
Atlanta, Ga	21	11	20	28	n. 39 w.	13
Macon, Ga †	14	4	8	11	n. 17 w.	10
Pensacola, Fla.†	14	5	16	4	n. 53 e.	15
Mobile, Ala	31	13	19	13	n. 18 e.	19
Montgomery, Ala	21	10	27	13	n. 52 e.	18
Meridian, Miss.†	10	6	12	9	n. 37 e.	5
Vicksburg, Miss	17	17	30	7	e.	23
New Orleans, La	29	10	15	20	n. 15 w.	20
Western Gulf States.						
Shreveport, La	17	18	27	16	s. 85 e.	11
Fort Smith, Ark	14	7	33	14	n. 70 e.	20
Little Rock, Ark	31	11	19	14	n. 14 e.	21
Corpus Christi, Tex	28	16	15	15	n.	12
Fort Worth, Tex†	15	8	6	13	n. 45 w.	10
Galveston, Tex	21	13	26	13	n. 58 e.	15
Palestine, Tex	28	18	21	14	n. 35 e.	12
San Antonio, Tex	27	17	16	16	n.	10
Ohio Valley and Tennessee.						
Chattanooga, Tenn	23	17	15	22	n. 49 w.	9
Knoxville, Tenn	23	14	17	26	n. 45 w.	13
Memphis, Tenn	28	18	15	15	n.	10
Nashville, Tenn	23	23	12	21	w.	9
Lexington, Ky.†	7	14	6	12	s. 41 w.	9
Louisville, Ky	13	22	11	28	s. 62 w.	19
Evansville, Ind.†	9	10	6	11	s. 79 w.	5
Indianapolis, Ind	15	24	3	33	s. 73 w.	31
Cincinnati, Ohio	7	25	13	28	s. 40 w.	23
Columbus, Ohio	5	24	11	35	s. 51 w.	31
Pittsburg, Pa	16	22	11	32	s. 74 w.	22
Parkersburg, W. Va	11	28	7	29	s. 52 w.	28
Elkins, W. Va	14	21	6	31	s. 74 w.	25
Lower Lake Region.						
Buffalo, N. Y	8	20	5	37	s. 69 w.	34
Oswego, N. Y	10	32	16	22	s. 15 w.	23
Rochester, N. Y	6	31	7	36	s. 49 w.	38
Erie, Pa	12	30	4	32	s. 57 w.	33
Cleveland, Ohio	3	37	14	22	s. 13 w.	35
Sandusky, Ohio	6	31	7	38	s. 51 w.	40
Toledo, Ohio	6	28	7	36	s. 53 w.	36
Detroit, Mich	7	30	7	37	s. 53 w.	38
Upper Lake Region.						
Alpena, Mich	16	19	5	36	s. 84 w.	31
Escanaba, Mich	12	21	4	39	s. 76 w.	36
Grand Haven, Mich	22	18	10	28	n. 77 w.	18
Marquette, Mich	13	14	6	40	s. 88 w.	34
Port Huron, Mich	7	31	7	30	s. 44 w.	33
Sault Ste. Marie, Mich	18	17	24	17	n. 82 e.	7
Chicago, Ill	16	20	6	38	s. 83 w.	32
Milwaukee, Wis	15	13	2	41	n. 87 w.	39
Green Bay, Wis	12	23	2	34	s. 71 w.	34
Duluth, Minn						
North Dakota.						
Moorhead, Minn	28	13	6	36	n. 63 w.	34
Bismarck, N. Dak	34	6	11	27	n. 30 w.	32
Williston, N. Dak	23	16	12	25	n. 62 w.	15

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
Upper Mississippi Valley.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
St. Paul, Minn	26	16	7	32	n. 68 w.	27
La Crosse, Wis. †	11	12	5	9	s. 70 w.	4
Davenport, Iowa	13	17	10	38	s. 82 w.	28
Des Moines, Iowa	31	6	12	26	n. 29 w.	29
Dubuque, Iowa	16	20	8	34	s. 81 w.	26
Keokuk, Iowa	18	21	6	32	s. 83 w	26
Cairo, Ill	24	19	12	22	n. 63 w.	11
Springfield, Ill	19	20	5	34	s. 88 w.	29
Hannibal Mo. †	11	10	2	16	n. 86 w.	14
St. Louis, Mo	12	22	9	29	s. 63 w.	22
Missouri Valley.						
Columbia, Mo.*	9	8	7	15	n. 83 w.	8
Kansas City, Mo	26	18	13	24	n. 54 w.	14
Springfield, Mo	26	18	20	15	s. 32 w.	9
Lincoln, Nebr	27	22	10	17	n. 54 w.	9
Omaha, Nebr	31	17	12	17	n. 20 w.	15
Sioux City, Iowa†	12	9	4	12	n. 69 w.	8
Pierre, S. Dak	25	11	18	22	n. 16 w.	15
Huron, S. Dak	24	14	12	27	n. 56 w.	18
Yankton, S. Dak †	13	6	3	15	n. 60 w.	41
Northern Slope.						
Havre, Mont	16	17	21	29	s. 83 w.	8
Miles City, Mont	20	20	14	13	e.	1
Helena, Mont	14	25	3	36	s. 15 w.	11
Kalispell, Mont	30	13	4	33	n. 60 w.	34
Rapid City, S. Dak	30	8	12	30	n. 39 w.	28
Cheyenne, Wyo	28	11	1	36	n. 64 w.	39
Lander, Wyo	14	31	18	22	s. 13 w.	18
North Platte, Nebr	16	20	14	26	s. 72 w.	13
Middle Slope.						
Denver, Colo	15	33	8	17	s. 27 w.	20
Pueblo, Colo	23	10	20	19	n. 4 e.	13
Concordia, Kans	21	22	15	16	s. 45 w.	1
Dodge, Kans	26	13	12	23	n. 40 w.	17
Wichita, Kans	29	20	10	14	n. 24 w.	10
Oklahoma, Okla	32	16	14	14	n.	16
Southern Slope.						
Abilene, Tex	20	21	11	24	s. 86 w.	13
Amarillo, Tex	28	18	9	17	n. 39 w.	13
Southern Plateau.						
El Paso, Tex	27	4	18	30	n. 28 w.	26
Santa Fe, N. Mex	30	14	25	10	n. 43 e.	12
Flagstaff, Ariz.	21	9	24	20	n. 18 e.	13
Phenix, Ariz	11	10	27	23	n. 76 e.	4
Yuma, Ariz	46	2	13	15	n. 3 w.	44
Independence, Cal	27	13	6	34	n. 63 w.	31
Middle Plateau.						
Carson City, Nev	19	19	16	24	w.	8
Winnemucca, Nev	21	13	27	13	n. 60 e.	16
Cedar City, Utah	17	22	23	13	s. 63 e.	11
Salt Lake City, Utah	13	28	17	17	s.	15
Grand Junction, Colo	27	10	26	21	n. 16 e.	18
Northern Plateau.						
Baker City, Oreg	6	42	15	10	s. 8 e.	36
Boise, Idaho	10	27	22	19	s. 10 e.	17
Pocatello, Idaho	15	27	18	14	s. 18 e.	13
Spokane, Wash	16	24	22	13	s. 48 e.	12
Walla Walla, Wash	4	45	7	14	s. 10 w.	42
North Pacific Coast Region.						
Neah, Wash						
Port Crescent, Wash.*	0	17	8	16	s. 25 w.	19
Seattle, Wash	11	35	26	3	s. 54 e.	41
Tacoma, Wash	7	38	11	20	s. 16 w.	32
Portland, Oreg	12	30	21	10	s. 31 e.	21
Roseburg, Oreg	9	31	26	12	s. 32 e.	26
Middle Pacific Coast Region.						
Eureka, Cal	14	25	26	13	s. 50 e.	17
Mount Tamalpais, Cal	30	9	20	15	n. 13 e.	22
Red Bluff, Cal	24	17	18	15	n. 23 e.	8
Sacramento, Cal	19	31	20	7	s. 47 e.	18
San Francisco, Cal	30	14	7	25	n. 48 w.	24
South Pacific Coast Region.						
Fresno, Cal	11	24	16	19	s. 13 w.	13
Los Angeles, Cal	30	9	9	24	n. 35 w.	26
San Diego, Cal	29	9	21	17	n. 11 e.	20
San Luis Obispo, Cal	35	7	5	16	n. 22 w.	30
West Indies.						
Basseterre, St. Kitts Island	38	3	35	1	n. 44 e.	49
Bridgetown, Barbados	27	4	45	0	n. 63 e.	50
Cienfuegos, Cuba	44	4	29	4	n. 32 e.	47
Havana, Cuba	14	10	39	8	n. 83 e.	31
Kingston, Jamaica						
Port of Spain, Trinidad	25	8	37	6	n. 61 e.	35
Puerto Principe, Cuba	41	1	32	5	n. 34 e.	48
Roseau, Dominica, W. I.	20	9	38	9	n. 69 e.	31
San Juan, Puerto Rico	22	17	36	6	n. 81 e.	30
Santiago de Cuba, Cuba	43	6	28	4	n. 33 e.	44
Santo Domingo, S. Domingo, W. I.						
Willemstad, Curaçao	15	0	35	0	n. 75 e.	57

* From observations at 8 p. m. only.

† From observations at 8 a. m. only.

TABLE VII.—*Thunderstorms and auroras, December*, 1899.

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	53	T.										3	3			1				1													8	4	T.
		A.																																0	0	A.
Arizona	53	T.																																0	1	T.
		A.																															1	0	1	A.
Arkansas	57	T.			1					1		6	2			1			1	15	2											1	0	1	T.
		A.																																29	8	A.
California	189	T.								4						1																	2	1	8	4	T.
		A.																																0	0	A.
Colorado	78	T.																																0	0	T.
		A.																																0	0	A.
Connecticut	32	T.																																0	0	T.
		A.																																0	0	A.
Delaware	5	T.																																0	0	T.
		A.																																0	0	A.
Dist. of Columbia	4	T.																																0	0	T.
		A.																																0	0	A.
Florida	45	T.											1			1																		0	0	T.
		A.																																2	2	A.
Georgia	54	T.																																0	0	T.
		A.																																0	0	A.
Idaho	27	T.																																0	0	T.
		A.																																0	0	A.
Illinois	92	T.	4										9																					0	0	T.
		A.																																13	2	A.
Indiana	55	T.																																0	0	T.
		A.																																0	0	A.
Indian Territory	8	T.																																0	0	T.
		A.																																0	0	A.
Iowa	126	T.																																0	0	T.
		A.																																0	0	A.
Kansas	74	T.			1							2																						0	0	T.
		A.																																3	2	A.
Kentucky	45	T.																																0	0	T.
		A.																																0	0	A.
Louisiana	45	T.																																0	0	T.
		A.								1	3	14	7	1		3	1	1		2	2												35	10	A.
Maine	17	T.				1																												0	0	T.
		A.																																1	0	A.
Maryland	39	T.				2															1													0	1	T.
		A.				1																			1									3	2	A.
Massachusetts	54	T.						2																										2	1	T.
		A.																																2	1	A.
Michigan	107	T.	1																															0	1	T.
		A.	1																															1	1	A.
Minnesota	64	T.																					1											2	2	T.
		A.																																0	0	A.
Mississippi	42	T.								1		9	4							1	3									1	1			3	3	T.
		A.																																17	4	A.
Missouri	89	T.									1	1	3						1	1			1				1							0	0	T.
		A.																							1									9	7	A.
Montana	87	T.																																0	0	T.
		A.		1	1					1		1			1										1									1	0	A.
Nebraska	145	T.																																0	0	T.
		A.																																0	0	A.
Nevada	45	T.																																0	0	T.
		A.																																0	0	A.
New Hampshire	20	T.																																0	0	T.
		A.																																0	0	A.
New Jersey	50	T.																																0	0	T.
		A.																																0	0	A.
New Mexico	38	T.																																0	0	T.
		A.																																0	0	A.
New York	103	T.																																0	0	T.
		A.																																0	0	A.
North Carolina	56	T.																																0	0	T.
		A.																																0	0	A.
North Dakota	40	T.																																0	0	T.
		A.																			1							2		2			5	3	A.
Ohio	124	T.																																0	0	T.
		A.																																0	0	A.
Oklahoma	22	T.																																0	0	T.
		A.																																0	0	A.
Oregon	71	T.		1					1							3						2									2		9	5	T.
		A.																																0	0	A.
Pennsylvania	100	T.																																0	0	T.
		A.																																0	0	A.
Rhode Island	8	T.																																0	0	T.
		A.																																0	0	A.
South Carolina	44	T.	1																															0	1	T.
		A.																																1	0	A.
South Dakota	52	T.				1										1															1		3	2	T.
		A.																																0	0	A.
Tennessee	61	T.										3								2														5	2	T.
		A.																																0	0	A.
Texas	83	T.							1	1	1	3								5	1													12	6	T.
		A.																																0	0	A.
Utah	34	T.																																0	0	T.
		A.																																0	0	A.
Vermont	14	T.																																0	0	T.
		A.																																0	0	A.
Virginia	47	T.											1																					0	1	T.
		A.																																1	0	A.
Washington	55	T.					1					1									1													0	1	T.
		A.																																0	0	A.
West Virginia	38	T.																																0	0	T.
		A.																																0	0	A.
Wisconsin	60	T.																																0	0	T.
		A.																									1		1					2	2	A.
Wyoming	18	T.																																0	0	T.
		A.																																0	0	A.
Sums	2,804	T.	6	1	2	4	1	2	2	7	5	41	30	2	1	10	1	1	2	27	9	3	0	1	1	0	1	0	0	3	0	5	2	167	....	T.
		A.	1	1	1	1	0	0	0	2	0	1	0	0	1	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	3	1	0	3	0	19	....	A.

TABLE VIII.—*Average hourly sunshine (in percentages), December, 1899.*

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																Hours of sunshine.			
		A. M.								P. M.								Total.			
		5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	Actual.	Possible.	Percent of possible.	Personal estimate.
																		Hours.	*Hours.*		
Albany, N. Y	T.				23	26	39	39	45	49	46	42	20	22				102.3	281.0	36	29
Atlanta, Ga	T.			61	39	51	53	61	61	60	66	65	55	33	0			168.7	307.7	55	45
Atlantic City, N. J	P.				56	63	76	86	90	84	77	72	60	58				214.3	293.7	73	58
Baltimore, Md	T.				12	27	58	65	74	71	69	61	32	22				149.2	293.7	51	55
Binghamton, N. Y	T.				17	29	37	40	44	48	33	32	22	20				94.7	284.7	33	26
Bismarck, N. Dak	P.				44	45	47	57	64	49	63	64	44	40				141.8	265.6	53	47
Boise, Idaho	P.																				35
Boston, Mass	T.				57	62	56	63	67	74	74	62	57	56				180.3	284.7	63	50
Buffalo, N. Y	T.				4	12	36	51	55	55	46	42	20	10				100.6	281.0	36	22
Cedar City, Utah	T.			82	58	60	71	80	83	77	69	63	61	50				200.8	296.7	68	57
Charleston, S. C	T.			60	48	49	53	50	59	52	49	45	42	41	33			152.6	310.7	49	48
Chattanooga, Tenn	T.			64	38	38	52	55	56	58	52	55	46	42				151.1	305.2	50	47
Cheyenne, Wyo	P.				42	55	70	75	73	65	76	71	53	33				182.0	287.8	63	53
Chicago, Ill	T.				9	11	23	45	56	58	51	44	29	31				105.5	284.7	37	37
Cincinnati, Ohio	T.				34	37	45	54	58	56	54	49	48	50				143.2	293.7	49	48
Cleveland, Ohio	T.				13	13	19	26	25	26	22	18	14	13				55.6	284.7	20	26
Columbia, Mo	T.				58	64	72	72	70	72	65	55	48	46				184.6	293.7	63	37
Columbus, Ohio	T.				33	39	46	45	48	51	48	46	42	39				128.4	291.7	44	37
Denver, Colo	P.				67	71	82	75	75	71	74	76	66	62				211.3	291.7	72	68
Des Moines, Iowa	T.				39	37	44	54	53	55	51	44	36	37				130.1	284.7	46	38
Detroit, Mich	T.				4	17	44	49	43	45	40	31	25	16				94.8	284.7	33	30
Dodge, Kans	P.			18	33	42	46	52	51	41	45	45	35	29				125.2	296.7	42	39
Dubuque, Iowa	T.				38	45	51	59	62	59	52	43	39	40				140.8	284.7	49	48
Eastport, Me	P.				34	33	42	43	41	45	48	45	37	38				113.3	274.3	41	33
Elkins, W. Va	T.				22	23	36	48	50	61	53	44	34	30				119.8	293.7	41	39
Erie, Pa	T.				6	10	23	31	26	25	26	18	15	16				57.5	284.7	20	18
Escanaba, Mich	T.				27	34	40	42	47	50	41	29	17	18				98.1	269.6	36	39
Eureka, Cal	P.				19	30	36	43	54	56	57	46	46	39				125.2	287.8	44	38
Fresno, Cal	T.			0	1	11	13	14	19	23	20	23	18	10				46.0	299.4	15	14
Galveston, Tex	P.			24	30	51	53	56	52	54	55	55	49	33	12			153.3	320.2	48	44
Grand Junction, Colo	P.				57	56	56	65	60	71	69	71	64	55				184.2	293.7	63	56
Harrisburg, Pa	T.				42	41	42	52	51	53	57	51	36	36				135.9	291.7	47	43
Helena, Mont	P.				7	9	19	41	29	38	40	27	14	14				72.2	265.6	27	27
Huron, S. Dak	T.				54	52	55	65	70	77	76	62	56	56				175.3	277.7	63	55
Indianapolis, Ind	T.				38	42	46	49	50	49	48	49	48	50				137.3	291.7	47	38
Jacksonville, Fla	T.			25	23	35	48	50	46	49	49	42	38	29	29			128.7	317.8	40	38
Jupiter, Fla	T.			24	33	62	72	76	88	86	78	73	52	35	34			207.0	324.0	64	48
Kalispell, Mont	T.				0	3	12	23	25	32	28	16	5	2				44.4	262.1	17	17
Kansas City, Mo	P.				44	42	44	46	43	36	42	42	40	44				123.9	293.7	42	43
Key West, Fla	T.			47	49	71	87	87	92	92	93	84	62	46	44			245.3	329.1	75	55
Knoxville, Tenn	T.			67	45	48	52	51	48	58	55	44	35	33				142.8	302.5	47	42
Lexington, Ky	T.			0	21	40	49	50	57	55	55	52	35	29				134.1	296.7	45	38
Little Rock, Ark	T.			9	20	28	40	60	65	66	60	55	44	41				146.3	305.2	48	43
Los Angeles, Cal	P.			61	62	70	74	72	71	74	77	72	68	56				214.5	307.7	70	63
Louisville, Ky	T.			0	33	35	46	50	52	54	51	45	34	31				129.5	296.7	44	45
Macon, Ga	T.			48	33	41	55	62	65	64	55	53	48	29	11			156.6	310.7	50	41
Meridian, Miss	T.			52	39	39	43	45	44	46	47	45	38	36	50			132.7	313.0	42	40
Minneapolis, Minn	T.				35	39	40	45	50	46	38	33	33	43				110.0	274.3	40	
Mount Tamalpais, Cal	P.			82	54	56	62	63	62	64	63	58	59	55				177.7	296.7	60	54
Nashville, Tenn	T.			33	33	37	43	50	57	59	60	56	37	37				142.6	302.5	47	45
New Haven, Conn	T.				44	44	59	70	74	77	68	63	48	39				172.3	287.8	60	60
New Orleans, La	T.			20	13	14	29	43	51	51	48	38	33	36	29			112.0	317.8	35	38
New York, N. Y	T.				48	56	76	83	83	75	76	70	54	32				193.7	287.8	67	51
Northfield, Vt	P.				20	25	37	44	45	41	40	29	21	20				93.2	277.7	34	23
Oklahoma, Okla	T.			64	38	46	57	70	73	67	67	61	52	48				177.5	305.2	58	47
Omaha *	T.																				39
Parkersburg, W. Va	T.				30	25	44	50	50	50	47	35	30	40				118.3	293.7	40	40
Phenix, Ariz	P.			68	64	71	81	83	82	84	85	80	74	68	33			239.7	310.7	77	63
Philadelphia, Pa	T.				60	64	75	85	84	85	81	66	63	57				212.4	291.7	73	56
Pittsburg, Pa	T.				21	17	27	34	40	38	40	35	26	34				90.0	287.8	31	37
Pocatello, Idaho	T.				26	28	47	56	59	60	61	46	36	37				131.6	281.0	47	36
Portland, Me	T.				17	31	49	57	55	51	49	45	25	15				117.7	277.7	42	38
Portland, Oreg	T.				7	6	15	28	39	42	35	19	14	12				62.2	269.6	23	22
Pueblo, Colo	T.			45	45	46	62	79	85	86	79	75	55	48				197.9	296.7	67	57
Raleigh, N. C	T.			100	53	69	75	79	78	80	73	70	60	48				208.7	302.5	69	63
Rochester, N. Y	T.				9	5	22	29	30	18	27	26	17	16				58.0	281.0	21	18
St. Louis, Mo	T.				35	35	48	62	66	61	57	55	37	29				145.2	293.7	49	43
St. Paul, Minn	P.				41	50	50	49	52	45	45	42	30	25				121.4	274.3	44	42
Salt Lake City, Utah	P.				33	35	43	49	55	55	55	49	39	35				125.2	287.8	44	45
San Diego, Cal	P.			68	68	77	80	78	79	79	75	79	74	69	18			235.6	310.7	76	74
San Francisco, Cal	T.			45	47	47	61	73	75	78	71	68	62	58				190.5	296.7	64	62
Santa Fe, N. Mex	P.			67	68	71	77	86	79	81	80	82	75	72				233.8	302.5	77	66
Sault Ste. Marie, Mich	T.				11	10	21	33	30	23	17	14	7	7				50.2	269.6	19	22
Savannah, Ga	T.			55	55	50	52	58	68	59	55	48	40	39	33			163.5	313.0	52	49
Seattle, Wash	T.				0	0	1	10	17	15	5	7	2	0				18.1	262.1	7	11
Spokane, Wash	T.				12	7	15	19	22	27	22	19	14	16				46.7	262.1	18	12
Tacoma, Wash	T.				0	3	11	21	20	17	14	14	5	6				33.0	295.6	12	10
Tampa, Fla	T.			42	43	60	65	76	81	77	63	60	44	29	32			190.6	322.9	59	39
Toledo, Ohio	T.				15	31	38	46	49	51	44	39	30	17				107.5	284.7	38	35
Topeka, Kans	T.				32	30	37	48	52	44	43	42	40	44				121.0	293.7	41	42
Vicksburg, Miss	T.			48	41	38	45	56	59	71	66	63	62	48	33			171.5	313.0	55	45
Washington, D. C	P.				72	76	74	74	73	77	79	70	56	55				208.8	293.7	71	66
Wilmington, N. C	T.			61	45	59	72	83	85	83	77	66	57	48	0			208.5	307.7	68	65
Yankton, S. Dak	T.				30	38	53	55	64	64	59	43	42	37				140.0	281.0	50	45
Basseterre, St. Kitts	T.			64	79	95	97	99	97	100	100	99	97	85	78			319.1	345.3	92	68
Bridgetown, Barbados	T.			48	68	73	83	79	73	71	70	67	54	47	37			230.7	353.4	65	42
Cienfuegos, Cuba	T.			81	80	81	84	85	89	84	82	65	63	65	65			260.4	335.4	78	76
Havana, Cuba	T.			31	34	58	76	87	84	80	79	75	65	58	55			226.0	334.7	68	64
Kingston, Jamaica, W. I	T.																				
Port of Spain, Trinidad, W. I	T.			63	72	85	90	90	85	78	71	61	57	39	31			246.4	356.5	69	47
Puerto Principe, Cuba	T.			54	53	71	69	71	64	65	58	53	53	45	46			200.9	338.2	59	53
Roseau, Dominica, W. I	T.			57	67	71	79	78	77	72	76	76	70	65	39			246.4	349.1	71	53
San Juan, Puerto Rico	T.			26	49	74	87	92	93	90	92	84	76	55	37			255.7	344.1	74	67
Santiago de Cuba, Cuba *	T.			84	87	77	82	82	83	78	76	60	50	55	44			246.5	340.9	72	52
Santo Domingo, Santo Domingo	T.																				
Willemstad, Curaçao	T.			28	34	46	60	56	57	52	54	51	42	34	35			164.8	355.3	46	38

*Incomplete.

TABLE IX.—*Accumulated amounts of precipitation for each 5 minutes, for storms in which the rate of fall equaled or exceeded 0.25 in any 5 minutes, or 0.75 in 1 hour during December, 1899, at all stations furnished with self-registering gages.*

Stations.	Date.	Total duration.		Total am't of precipitation.	Excessive rate.		Amount before excessive began.	Depths of precipitation (in inches) during periods of time as indicated.												
		From—	To—		Began—	Ended—		5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
	1	2	3	4	5	6	7														
Albany, N. Y.	3-4			0.52														*			
Atlanta, Ga.	23			1.77														0.57			
Atlantic City, N. J.	24			0.61														*			
Baltimore, Md.	12			0.40														0.26			
Binghamton, N. Y.	12			0.90														0.40			
Bismarck, N. Dak.	25			0.20														*			
Boise, Idaho	10-11			0.25														0.10			
Boston, Mass.	15			0.88														0.31			
Buffalo, N. Y.	11			0.52														0.15			
Cairo, Ill.	10-11			1.85														0.42			
Charleston, S. C.	12			0.22														0.14			
Chicago, Ill.	11			1.30														0.18			
Cincinnati, Ohio	10-11			0.97														0.26			
Cleveland, Ohio	2-3			0.67														0.08			
Columbia, Mo.	10-11			0.33														0.13			
Columbus, Ohio	10-11			0.78														0.29			
Denver, Colo.	9-10			0.36														*			
Des Moines, Iowa	10-11			1.05														0.11			
Detroit, Mich.	11-12			0.71														0.44			
Dodge, Kans	13			0.46														*			
Duluth, Minn.	9			0.67														*			
Eastport, Me.	15			0.60														0.21			
Elkins, W. Va.	12			0.77														0.37			
Erie, Pa.	10-11			0.96														*			
Escanaba, Mich.	11-12			0.65														0.14			
Evansville, Ind	10-11			1.28														0.22			
Fort Worth, Tex.	8			0.57														0.10			
Fresno, Cal.	5			0.36														0.09			
Galveston, Tex.	10	2.16 p. m.	3.45 p. m.	1.06	2.41 p. m.	3.05 p. m.	0.01	0.25	0.39	0.62	0.96	1.03									
Grand Junction, Colo.	8-9			0.24														*			
Hannibal, Mo.	10-11			0.36														*			
Harrisburg, Pa	23-24			1.06														0.24			
Hatteras, N. C.	24	1.50 a. m.	4.00 a. m.	1.28	2.05 a. m.	3.00 a. m.	0.05	0.09	0.16	0.32	0.38	0.48	0.52	0.54	0.57	0.60	0.63	0.73			
Huron, S. Dak.	25			0.11														*			
Indianapolis, Ind.	10-11			0.99														0.18			
Jacksonville, Fla.	14	4.40 p. m.	8.09 p. m.	1.06	4.42 p. m.	5.07 p. m.	T.	0.02	0.30	0.47	0.58	0.67									
Jupiter, Fla.	21	6.30 p. m.	10.30 p. m.	1.06	7.00 p. m.	7.30 p. m.	0.21	0.26	0.33	0.34	0.44	0.63	0.77	0.78	0.80						
Kalispell, Mont	11			0.61														*			
Kansas City, Mo.	9			0.50														0.07			
Key West, Fla.	6			0.54								0.40									
Knoxville, Tenn	23			0.94														0.20			
Lexington, Ky.	11			0.40														*			
Lincoln, Nebr.	8-11			1.05														0.09			
Little Rock, Ark.	10	9.46 a. m.	D. N.	2.36	9.05 p. m.	9.50 p. m.	1.43	0.05	0.18	0.27	0.35	0.42	0.52	0.65	0.71	0.76	0.79	0.83			
Los Angeles, Cal.	16			0.84														0.14			
Louisville, Ky.	10-11			1.84														0.28			
Macon, Ga.	23			1.32														0.50			
Memphis, Tenn.	18-19			1.83														0.32			
Meridian, Miss.	10-11	8.15 p. m.	11.40 a. m.	3.00	2.30 a. m.	3.20 a. m.	1.65	0.13	0.25	0.55	0.72	0.77	0.82	0.92	0.95	0.95	1.10	1.14			
Milwaukee, Wis.	10-11			1.23														0.16			
Montgomery, Ala.	11			1.70														0.47			
Nantucket, Mass.	15			0.38														0.27			
Nashville, Tenn.	10-11			2.56														0.59			
New Orleans, La.	10-11			0.88														0.23			
New York, N. Y.	24			0.77														0.20			
Norfolk, Va.	12			0.40														0.31			
Northfield, Vt.	12			0.48														0.15			
Oklahoma, Okla.	8-9			0.69														0.09			
Omaha, Nebr.	8-9			0.98														0.08			
Parkersburg, W. Va.	11-12			0.71														0.22			
Philadelphia, Pa.	12			0.40														0.18			
Pittsburg, Pa.	12			0.71														0.19			
Pocatello, Idaho	15-16			0.38														*			
Portland, Me.	24-25			0.81														0.40			
Portland, Oreg.	10-11			0.77														0.14			
Raleigh, N. C.	23-24			1.09														0.38			
Richmond, Va.	23-24			0.98														0.30			
Rochester, N. Y.	24			1.13														0.21			
St. Louis, Mo.	13-14			0.40														*			
St. Paul, Minn.	8-10			1.20														0.12			
Salt Lake City, Utah	5-6			0.24														*			
San Diego, Cal.	16-17			0.54														0.25			
San Francisco, Cal.	29-30			0.66														0.29			
Savannah, Ga.	10			0.61														*			
Seattle, Wash.	19-21			1.01														0.14			
Spokane, Wash	10-11			0.57														*			
Tampa, Fla.	11-12			1.12														*			
Vicksburg	10-11	8.45 a. m.	6.30 a. m.	5.56	6.00 p. m.	7.00 p. m.	1.83	0.06	0.19	0.34	0.48	0.66	0.81	0.98	1.24	1.34	1.47	1.95	2.06	2.19	2.39
Washington, D. C.	12			0.46														0.36			
Wilmington, N. C.	23-24			0.90														0.27			
Yankton, S. Dak	8-9			0.72														0.12			
Bridgetown, Barbados	6	1.10 p. m.	2.50 p. m.	0.96	1.20 p. m.	2.15 p. m.	0.03	0.09	0.26	0.43	0.53	0.61	0.68	0.71	0.72	0.72	0.91				
Cienfuegos, Cuba	24			0.18											0.18						
Havana, Cuba.	24			0.72							0.46										
Port of Spain, Trin.	1	12.20 p. m.	3.20 p. m.	2.42	12.20 p. m.	1.15 p. m.	0.00	0.21	0.36	0.72	0.99	1.36	1.68	1.84	1.95	2.00	2.06	2.16	2.25	2.37	
Do	22	11.50 a. m.	1.30 p. m.	1.26	12.08 p. m.	12.50 p. m.	0.01	0.21	0.43	0.80	1.01	1.12	1.15	1.17	1.20	1.23	1.24				
Puerto Principe, Cuba	1			1.36														0.38			
Rosseau, Dom., W. I.	11-12			0.40														0.32			
San Juan, Puerto Rico.	18			0.31						0.29											
Santiago de Cuba	29			0.44														0.43			
Willemstad, Curaçao.	19			0.64											0.64						

*Self-register not working.

TABLE X.—*Excessive precipitation, by stations, for December*, 1899.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	*Inches.*	*Inches.*		*Ins.*	*h.m.*	
Ashville		2.63	11			
Bermuda		2.70	11			
Birmingham		3.41	11			
Citronelle		2.91	10-11			
Clanton		3.00	11			
Decatur		3.22	10-11			
Eufaula		2.70	11-12			
Eutaw		3.30	10-11			
Evergreen		2.70	10-11			
Florence		3.52	10-11			
Fort Deposit		2.70	11-12			
Jasper		3.02	11			
Madison		3.30	11			
Marion		4.20	10-11			
Mobile		2.92	10-11	2.00	2 00	11
Mount Willing		2.67	11			
Newburg		4.60	10-11			
Riverton		3.73	10-11			
Talladega		3.15	11			
Tuscaloosa		3.73	10-11			
Tuskegee		2.56	11			
Union Springs		2.50	10-11			
Uniontown		3.29	10			
Arkansas						
Camden		3.30	9-10			
Lonoke		3.17	9-10			
California.						
Anada	15.28	3.40	14			
Bear Valley	12.81	2.88	15			
Bowman	15.72	3.30	12			
Do		2.78	15			
Do		2.50	29-30			
Cahto	13.98					
Crescent City	11.28					
Edmanton	11.89	4.88	14-15			
Fort Ross		3.35	30			
Georgetown	11.91	3.30	12			
Grass Valley	11.35					
Jackson		2.50	12			
Kennedy Goldmine		2.75	12			
Laporte	16.23	3.36	15			
Do		3.31	30			
Malakoff Mine	13.09	2.70	12			
Do		2.71	30			
Nevada City	10.27					
North San Juan	12.41	3.42	12			
Oleta		2.63	12			
Peachland		2.61	30			
Pilot Creek	12.56	3.06	12			
Do		2.91	14			
San Luis Obispo		2.56	14-15			
Summerdale	13.63	5.63	15			
Do		2.95	30			
Upper Lake		3.08	31			
Upper Mattole	17.84	8.74	30-31			
Florida.						
Pensacola		2.63	10-11			
Indiana.						
Bloomington		2.61	11-12			
Vevay		2.50	10-11			
Iowa.						
Monticello		3.95	11-12			
Ridgeway		3.50	11			
Louisiana.						
Alexandria		4.90	11			
Clinton		2.70	10			
Como		4.27	10			
Grand Coteau		2.77	8			
Do		3.10	10			
Jeanerette		2.60	19-20			
Jennings		3.38	10			
Do		2.62	20			
L'Argent		6.45	10			
Melville		5.25	9-10			
Montgomery		2.70	10			
Oakridge		3.49	10-11			
Rayne	10.87	2.98	9			
Do		3.18	11			
White Sulphur Springs		4.67	10			
Minnesota.						
Caledonia		3.83	11-12			

TABLE X.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Mississippi.	*Inches.*	*Inches.*		*Ins.*	*h.m.*	
Batesville		2.85	11			
Booneville		2.60	10			
Canton		5.40	10-11			
Columbus		3.50	11			
Crystal Springs		5.10	10			
Edwards	10.70	6.18	10-11			
Fayette		6.20	11			
Greenwood		3.16	10			
Holly Springs		3.80	11			
Louisville		5.46	10			
Meridian		3.23	10-11	1.12	0 56	11
Natchez		4.00	10-11			
Palo Alto		3.06	11			
Port Gibson	11.42	7.87	11			
Thornton		2.70	10			
Vicksburg		5.56	10-11	1.88	0 55	10
Water Valley		3.21	10			
Woodville	11.39	7.51	10-11			
North Carolina.						
Flat Rock		4.82	11-12			
Hendersonville		4.14	11-12			
Highlands	10.55	6.93	9-11			
Horse Cove		4.70	10-11			
Linnville		5.24	11-12			
Oregon.						
Alpha	13.68					
Astoria	13.30					
Bandon	10.87					
Bay City	14.38					
Cascade Locks	11.83					
Coquille	13.58	2.92	31			
Fairview	14.24					
Falls City	10.79					
Gardiner	14.45					
Glenora	18.48	3.32	1			
Government Camp	10.10					
Kerby	13.70	2.56	15			
Langlois	18.15					
Nehalem	11.60					
Newport	11.67					
Tennessee.						
Ashwood		3.28	11			
Erasmus		2.76	11			
Hohenwald		3.18	11			
Iron City	12.03	5.10	10			
Lafayette		3.00	11			
Lewisburg		3.28	10-11			
Lynnville		3.53	11			
Nashville		2.70	10-11			
Nunnelly		4.34	10-11			
Tracy City		3.30	11			
Tullahoma		3.50	10-11			
Waynesboro		3.40	10-11			
Yukon		3.70	10-11			
Texas.						
Alvin		2.77	8			
Blanco		2.75	7			
Brazoria		3.30	8			
Danevang		3.67	8			
Hulen		2.70	8			
Rockisland		4.10	7-8			
Virginia.						
Hot Springs		2.50	11			
Washington.						
Aberdeen	10.13					
Cedarlake	13.78					
Clearwater	22.16	3.06	22			
Fort Canby		2.67	*			
Monte Cristo	15.07	5.38	21-22			
Southbend	10.38					
Union City	11.54					
Puerto Rico.						
Humacao		2.80	3			
West Indies.						
Port of Spain, Trinidad				1.93	0 40	1
Do				1.01	0 19	22

* November 30 to December 1.

TABLE XI.—*Data furnished by the Canadian Meteorological Service, December*, 1899.

Stations.	Pressure.			Temperature.				Precipitation.		
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Mean maximum.	Mean minimum.	Total.	Departure from normal.	Depth of snow.
	Ins.	*Ins.*	*Ins.*	°	°	°	°	*Ins.*	*Ins.*	*Ins.*
St. Johns, N. F.	29.84	29.99	+.14	32.0	+ 3.3	37.5	26.5	6.38	.....	1.7
Sydney, C. B. I.	29.98	30.02	+.14	33.1	+ 4.9	39.7	26.6	7.60	+2.88	12.0
Halifax, N. S.	29.93	30.04	+.09	33.0	+ 5.4	40.6	25.3	5.04	−0.25	18.8
Grand Manan, N. B.	29.98	30.03	+.04	32.2	+ 3.9	38.8	25.5	4.91	+0.24	30.3
Yarmouth, N. S.	29.96	30.04	+.06	33.2	+ 2.5	40.1	26.2	4.08	−1.19	15.1
Charlottet'n, P. E. I.	29.96	30.00	+.08	29.8	+ 5.5	36.5	23.2	2.29	−1.71	6.8
Chatham, N. B.	29.99	30.01	+.07	21.5	+ 4.5	30.6	12.4	3.36	+0.39	15.9
Father Point, Que.	29.95	29.98	+.02	20.7	+ 4.3	28.9	12.5	4.45	+2.23	32.8
Quebec, Que.	29.66	30.02	+.01	21.6	+ 5.4	27 3	16.0	4.09	−0.22	12.6
Montreal, Que.	29.77	29.99	−.04	24.1	+ 5.8	30.8	17.5	4.84	+1.28	24.9
Bissett, Ont.	29.33	29.98	−.05	19.3	+ 4.1	28.3	10.3	3.05	+0.31	14.2
Ottawa, Ont.	29.62	29.96	...	22.2	+ 5.2	28.7	15.6	3.24	.....	10.0
Kingston, Ont.	29.66	30.00	−.05	27.4	+ 3.7	34.3	20.4	5.77	+2.13	23.1
Toronto, Ont.	29.60	30.00	−.06	29.1	+ 2.1	35.2	23.0	2.50	−0.04	3.2
White River, Ont.	28.54	30.00	−.06	6.4	− 3.3	17.8	− 5.0	2.08	+0.64	20.8
Port Stanley, Ont.	29.35	30.02	−.04	28.6	+ 0.2	34.7	22.6	2.73	+0.12	5.1
Saugeen, Ont.	29.21	29.96	−.06	27.8	+ 1.1	33.8	21.7	4.09	−0.04	26.8
Parry Sound, Ont.	29.22	29.96	−.07	22 8	+ 1.6	31.0	14.7	8.31	+4.38	53.0
Port Arthur, Ont.	29.22	29.97	−.06	14.3	+ 1.1	23.4	5.2	1.25	+0.40	4.7
Winnipeg, Man.	29.21	30.10	−.01	9.7	+ 5.6	18.6	0.8	0.11	−1.08	1.1
Minnedosa, Man.	28.19	30.13	+.02	10.4	+ 4.7	30.1	0.7	0.18	−0.55	1.8
Qu'Appelle, Assin.	27.73	30.15	+.02	8.9	+ 1.5	16.9	1.0	0.82	+0.18	8.2
Medicine Hat, Assin.	27.70	30.10	−.01	22.0	+ 3.8	30.3	13.7	0.91	+0.55	6.1
Swift Current, Assin.	27.43	30.16	+.03	16.8	+ 0.8	24.4	9.2	0.33	−0.38	8.3
Calgary, Alberta	26.35	30.04	−.09	19.2	+ 1.0	27.5	10.9	0.44	−0.34	4.2
Banff, Alberta	25.27	30.10	.....	19.9	.....	25.8	13.9	1.97	.....	16.1
Edmonton, Alberta	27.63	30.07	+.06	14.4	+ 1.3	23.0	5.8	0.78	+0.38	7.8
Prince Albert, Sask.	28.45	30.12	.....	4.9	+ 2.1	14.2	− 4.4	0.81	.....	8.1
Battleford, Sask.	28.30	30.17	.....	8.4	+ 3.0	16.5	0.4	0.57	.....	5.7
Kamloops, B. C.	28.80	30.12	.....	32.0	.....	36.8	27.2	0.66	.....	0.2
Victoria, B. C.	29.92	30.02	.....	43.0	.....	46.8	39.2	5.28	.....	2.5
Barkerville, N. W. T.	25.50	29.96	.....	21.8	.....	28.4	15.1	2.36	.....	22.0
Hamilton, Bermuda.	29.89	30.05	−.04	63.4	− 1.3	67.7	59.2	4.69	.....	

Chart I. Tracks of Centers of High Areas. December, 1899.

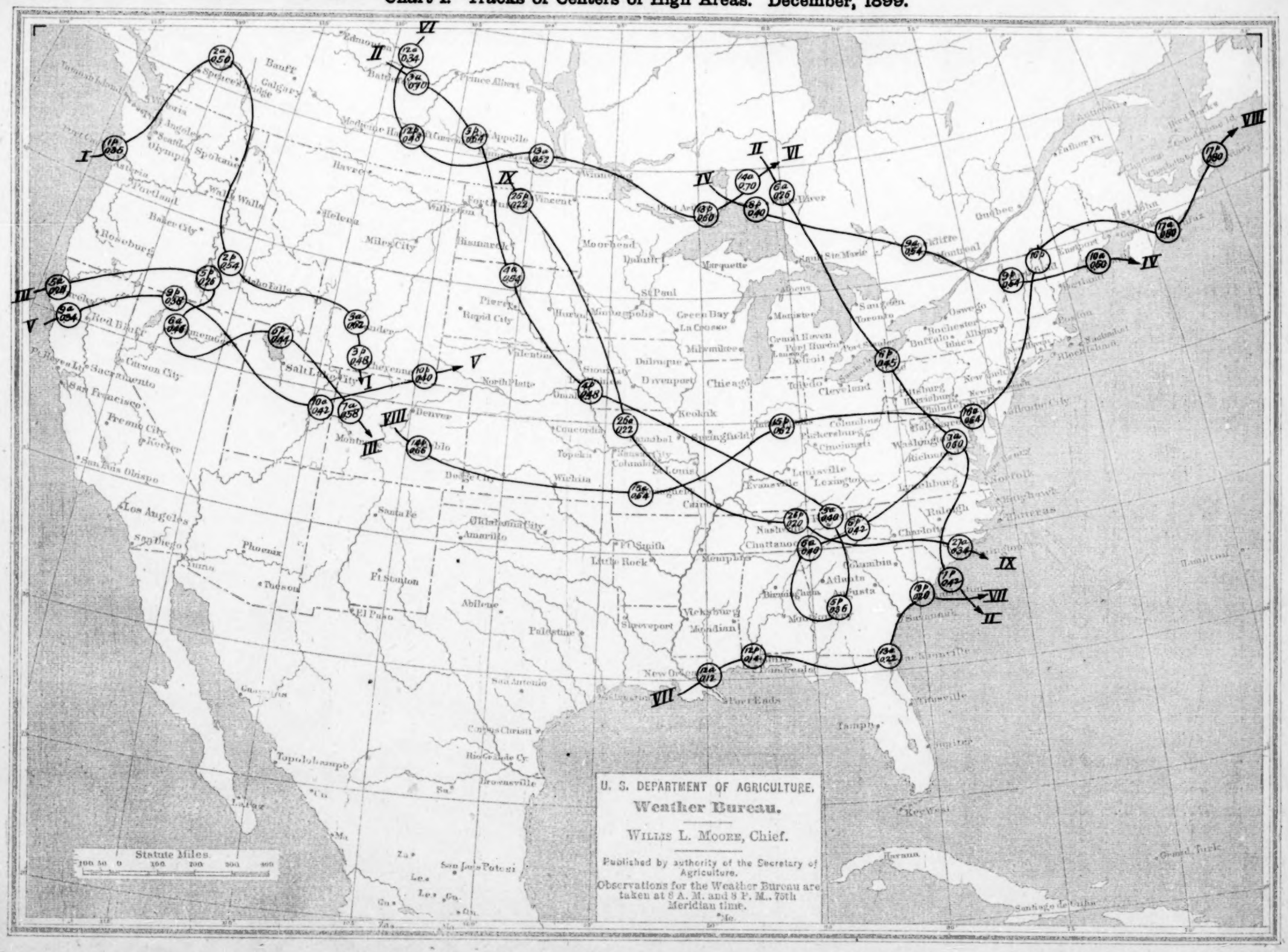


Chart II. Tracks of Centers of Low Areas. December, 1899.

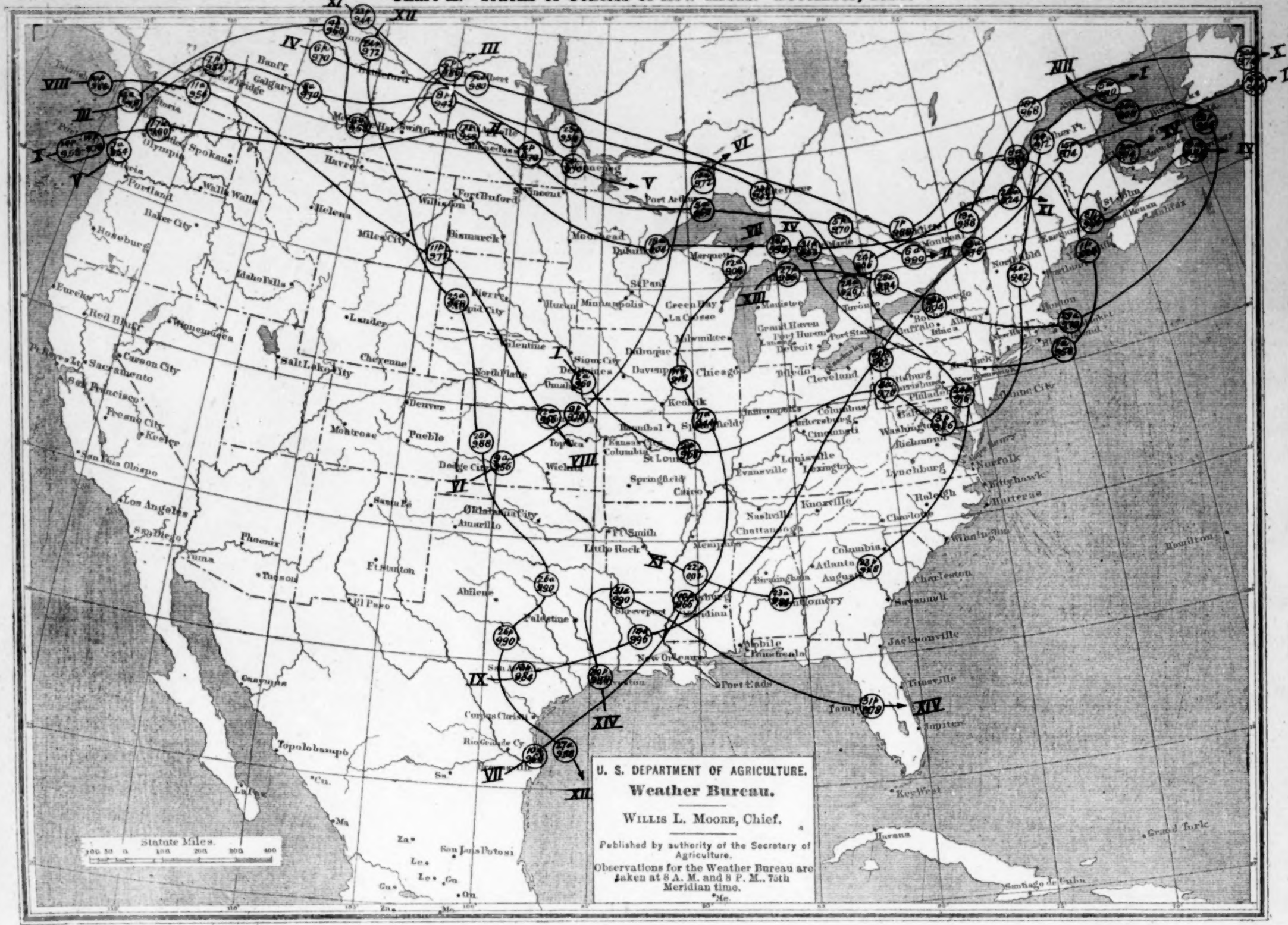


Chart III. Total Precipitation. December, 1899.

Chart III. Total Precipitation. December, 1899.

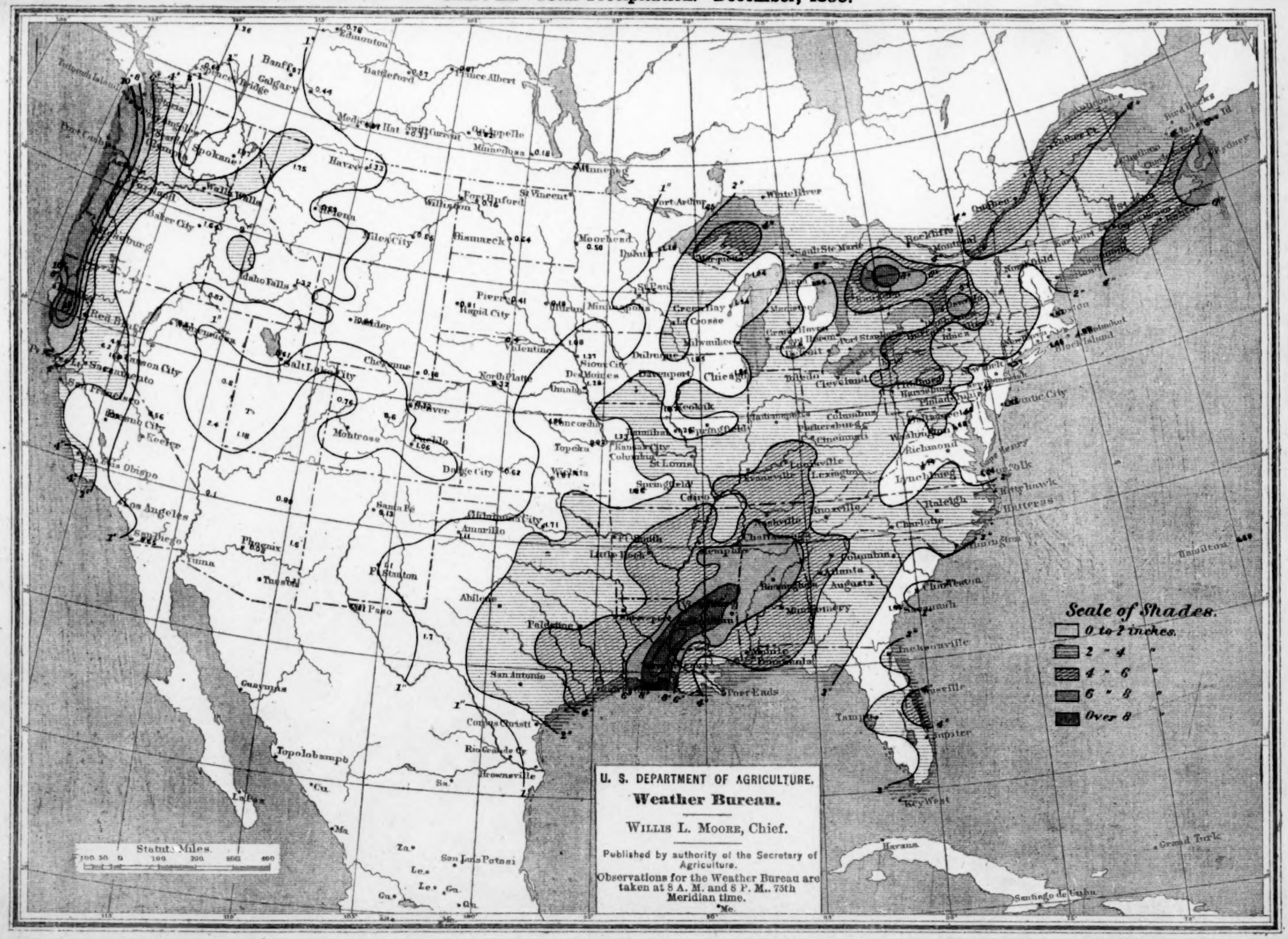
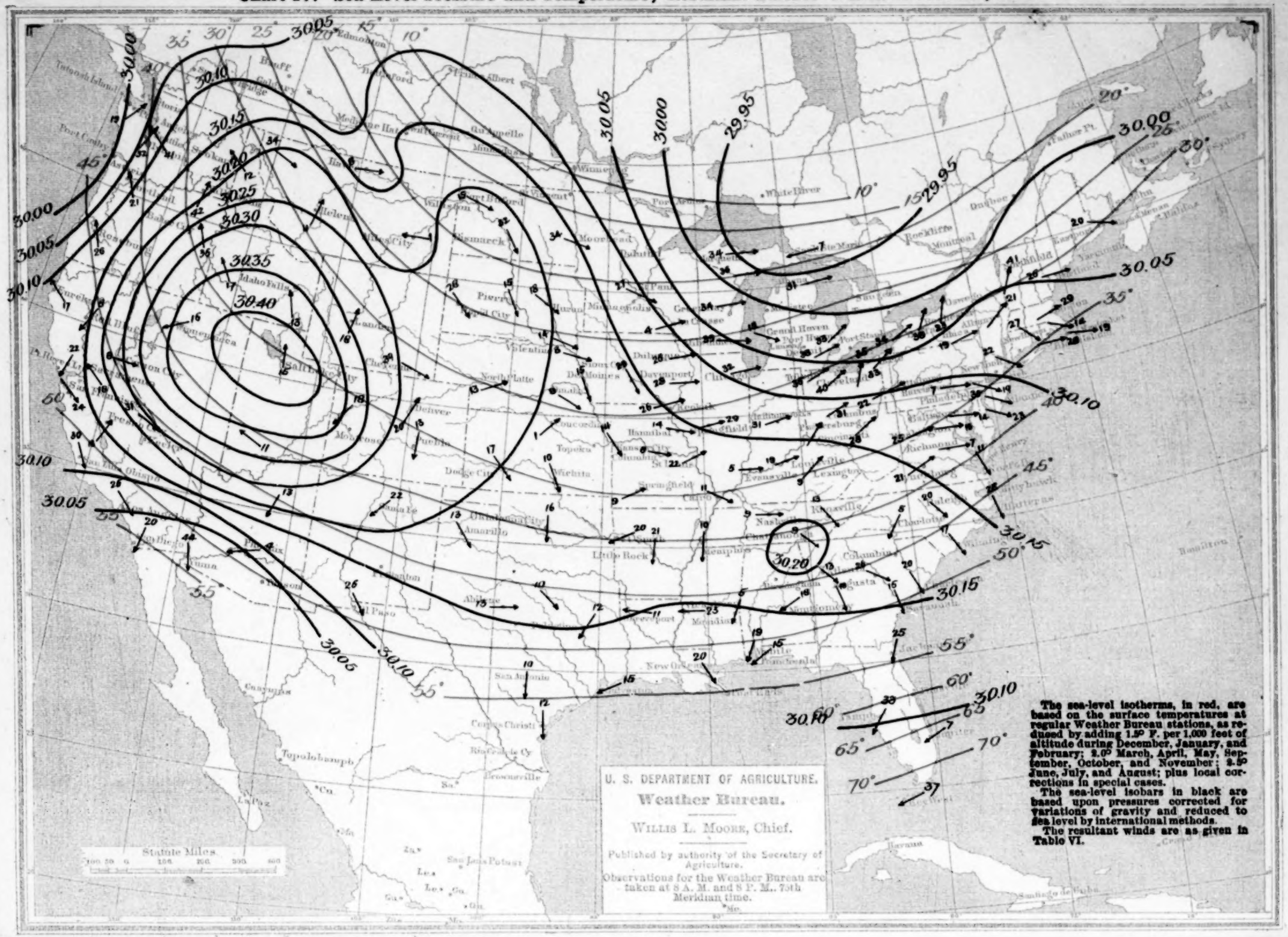


Chart IV. Sea-Level Pressure and Temperature; Resultant Surface Winds. December, 1899.



The sea-level isotherms, in red, are based on the surface temperatures at regular Weather Bureau stations, as reduced by adding 1.5° F. per 1,000 feet of altitude during December, January, and February; 2.0° March, April, May, September, October, and November; 2.5° June, July, and August; plus local corrections in special cases.

The sea-level isobars in black are based upon pressures corrected for variations of gravity and reduced to sea level by international methods.

The resultant winds are as given in Table VI.

Chart V. Hydrographs for Seven Principal Rivers of the United States. December, 1899.

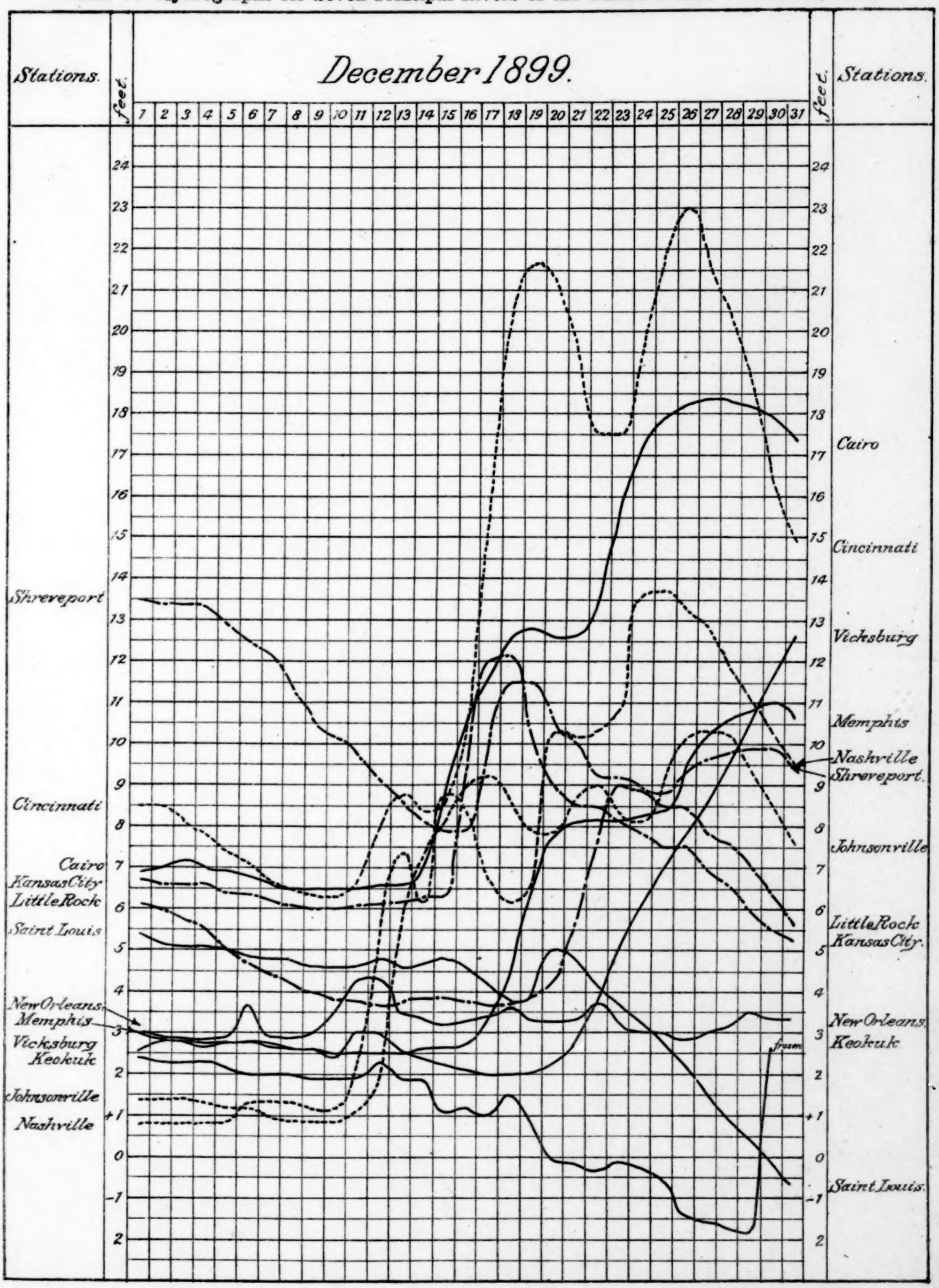


Chart VI. Surface Temperatures; Maximum, Minimum, and Mean. December, 1899.

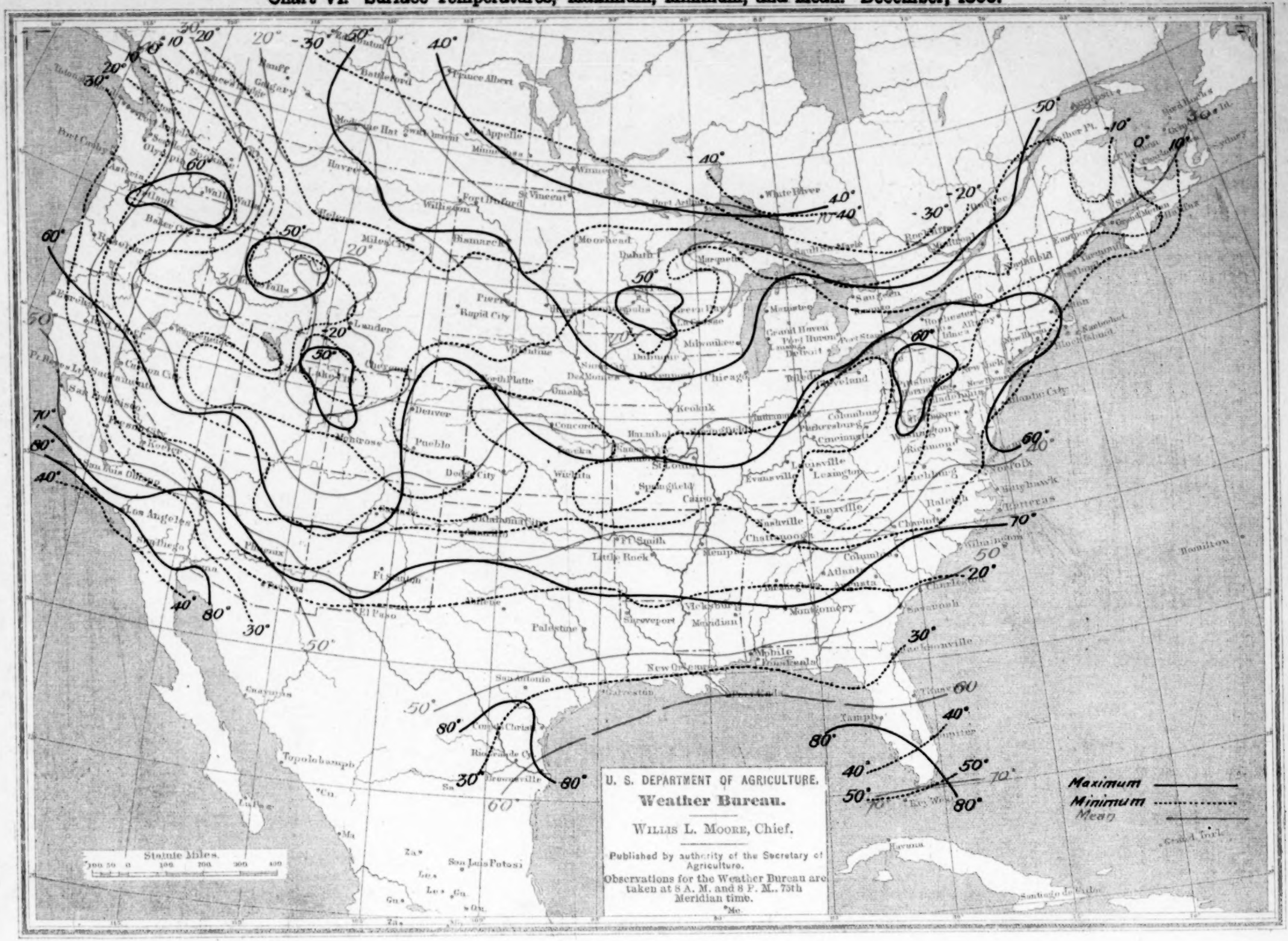


Chart VII. Percentage of Sunshine. December, 1899.

Chart VII. Percentage of Sunshine. December, 1899.

Chart VIII. Total Snowfall for December, 1899.

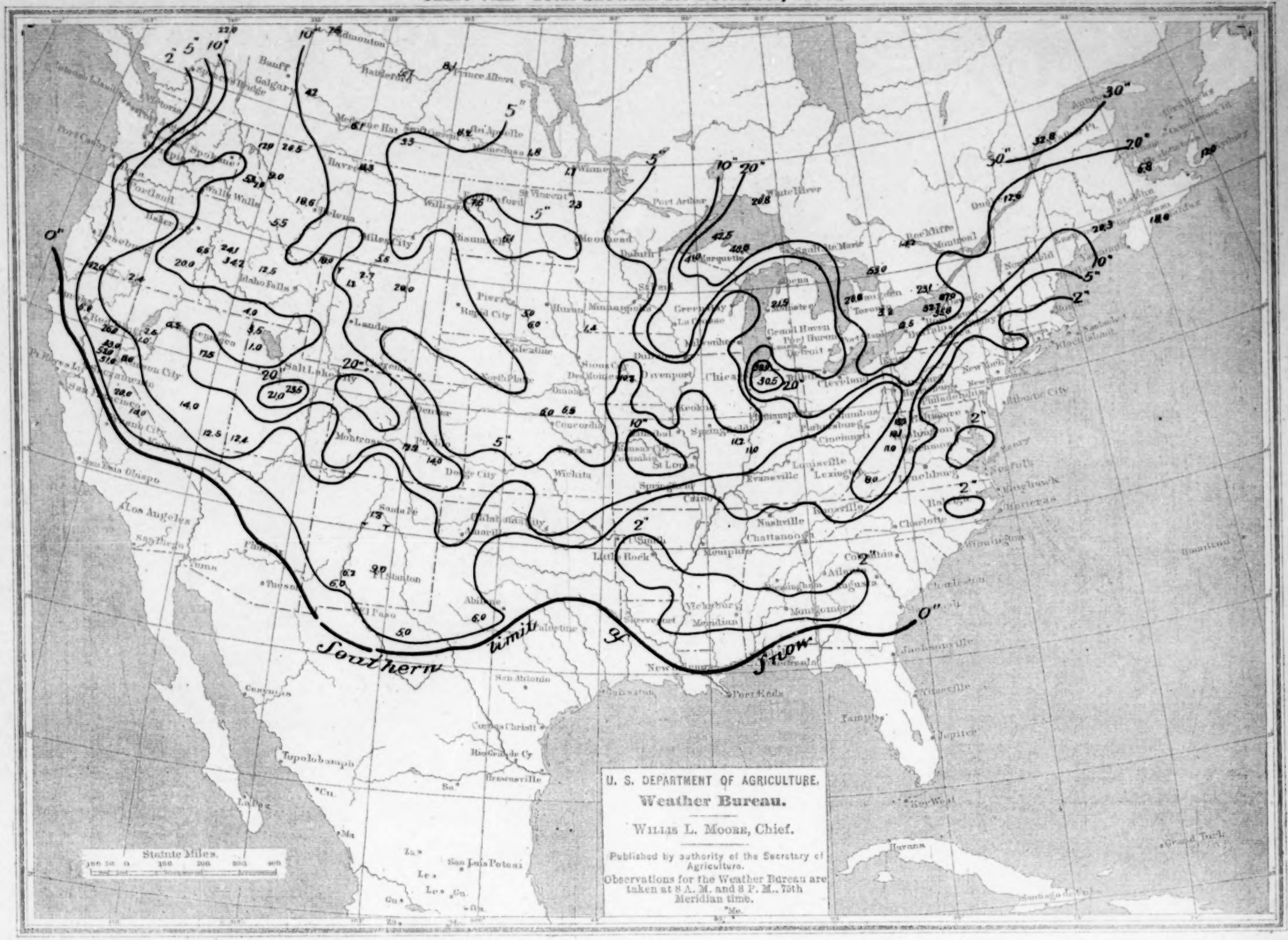


Chart IX. Snow on Ground on December 31, 1899.

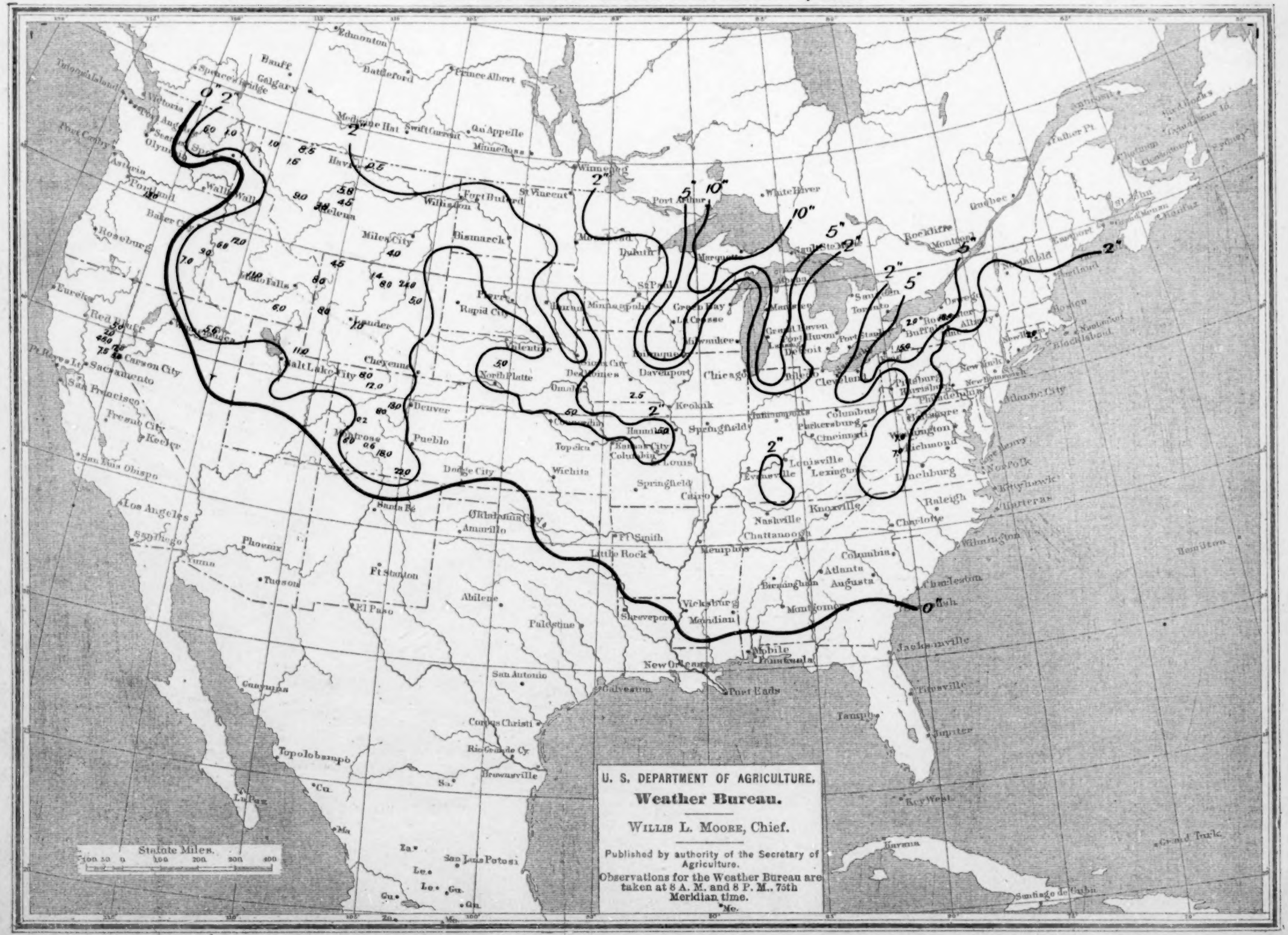


Chart X. West Indian Monthly Isobars, Isotherms, and Resultant Winds. December, 1899.